



# ENVIRONMENTAL ASSESSMENT BOARD

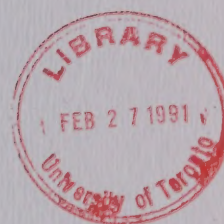
VOLUME: 293

DATE: Tuesday, February 19, 1991

BEFORE:

A. KOVEN Chairman

E. MARTEL Member

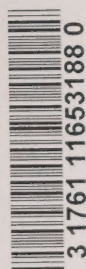


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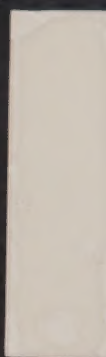
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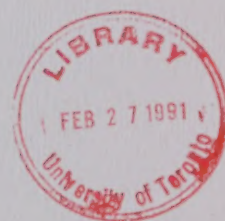
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A. KOVEN Chairman

E. MARTEL Member



FOR HEARING UPDATES CALL (COLLECT CALLS ACCEPTED) (416) 963-1249

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2300 Yonge St., Suite 709, Toronto, Canada M4P 1E4







HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL  
RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR  
TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental  
Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental  
Assessment for Timber Management on Crown  
Lands in Ontario;

- and -

IN THE MATTER OF a Notice by the  
Honourable Jim Bradley, Minister of the  
Environment, requiring the Environmental  
Assessment Board to hold a hearing with  
respect to a Class Environmental  
Assessment (No. NR-AA-30) of an  
undertaking by the Ministry of Natural  
Resources for the activity of timber  
management on Crown Lands in Ontario.

-----  
Hearing held at the offices of the Ontario  
Highway Transport Commission, Britannica  
Building, 151 Bloor Street West, 10th Floor,  
Toronto, Ontario, on Tuesday, February 19,  
1991, commencing at 9:00 a.m.

-----  
VOLUME 293

BEFORE:

MRS. ANNE KOVEN  
MR. ELIE MARTEL

Chairman  
Member





A P P E A R A N C E S

MR. V. FREIDIN, Q.C.)	
MS. C. BLASTORAH )	MINISTRY OF NATURAL
MS. K. MURPHY )	RESOURCES
MR. B. CAMPBELL )	
MS. J. SEABORN )	MINISTRY OF ENVIRONMENT
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MS. M. SWENARCHUK )	FORESTS FOR TOMORROW
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MR. B. McKERCHER )	OUTFITTERS ASSOCIATION





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MS. B. LLOYD	)	
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MR. D. SCOTT	)	NORTHWESTERN ONTARIO
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MR. G.J. KINLIN		DEPARTMENT OF JUSTICE
MR. S.J. STEPINAC		MINISTRY OF NORTHERN DEVELOPMENT & MINES
MR. M. COATES		ONTARIO FORESTRY ASSOCIATION
MR. P. ODORIZZI		BEARDMORE-LAKE NIPIGON WATCHDOG SOCIETY



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NORTHWESTERN ONTARIO  
TOURISM ASSOCIATION





I N D E X   O F   P R O C E E D I N G S

<u>Witness:</u>	<u>Page No.</u>
<u>JAMES F. BENDELL,</u> <u>JOHN MIDDLETON,</u> <u>ROGER SUFFLING, Resumed</u>	52177
Continued Direct Examination by Mr. Lindgren	52177
Cross-Examination by Mr. Hanna	52326
Scoping Session	52364



I N D E X   O F   E X H I B I T S

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
1725	Twenty-five page article by Dr. Suffling entitled Climate Change and Boreal Forest Fires in Phenoscandia, dated June 1990.	52216
1726	Article by Dr. Suffling entitled Catastrophic Disturbance and Landscape Diversity: The Implications of Fire Control and Climate Change in Subarctic Forests, dated May 1987.	52216
1727	Article by Dr. Suffling, Catherine Lihou and Evette Moran entitled Control of Landscape Diversity by Catastrophic Disturbance: A Theory and a Case Study of Fire in a Canadian Boreal Forest.	52217
1728	Article by Glen Jordan and Emin Baskent entitled: GIS, FORMAN: A Next Generation Wood Supply Model, a paper delivered at the GIS '91 conference in Vancouver in the week of February 12th to the 15th, 1991.	52217
1729	Hard copies of the overheads to be used by Dr. Suffling consisting of 17 pages.	52231
1730	Two-page excerpt from an article by Dr. Suffling entitled Stability and Diversity in Boreal and Mixed Temperate Forests: A Demographic Approach.	52232





I N D E X   O F   E X H I B I T S  
(Continued)

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
1731	Document entitled An Integrated Approach to Forest Classification using Digital Forest Resources Data and Landsat Imagery, dated November 1990 and the authors are R.N. Pierce and D. Sulter.	52314
1732	Map entitled Reclassified Forest Resource Inventory based on 1987 FRI data relating to an area to the northeast of Cochrane, Ontario.	52315
1733	Landsat image dated June 1987 relating to the Cochrane area and is the basis for Exhibit 1724.	52318
1734	Four-page document consisting of hard copies of the four overheads that Dr. Suffling drew during the course of his evidence.	52326





1 ---Upon commencing at 9:05 a.m.

2 MADAM CHAIR: Good morning. Please be  
3 seated.

4 Mr. Lindgren.

5 MR. LINDGREN: Good morning, Madam Chair  
6 and Mr. Martel.

7 I would like to start, Madam Chair, by  
8 commencing at page 35 of the witness statement and this  
9 is a section of Dr. Middleton's evidence entitled  
10 Landscape Planning and Management.

11 JAMES F. BENDELL,  
12 JOHN MIDDLETON,  
ROGER SUFFLING, Resumed

13 CONTINUED DIRECT EXAMINATION BY MR. LINDGREN:

14 Q. Dr. Middleton, can you advise me what  
15 the overall objective of landscape management and  
16 planning is?

17 DR. MIDDLETON: A. It is to ensure that  
18 we don't lose any parts of our landscape, and thus that  
19 we don't lose any of our native species of whatever any  
20 kind inadvertently; that is to say, in the absence of  
21 detailed species by species information about any of  
22 them.

23 Q. Now, does that mean that the  
24 landscape mosaic is frozen in time?

25 A. No, definitely not. There are

1 characteristics of the mosaic which continue through  
2 time, which is our goal, without in any sense saying  
3 that development or forestry or anything else would  
4 cease within them.

5 If I may use a picture. This was taken  
6 from the cover of -- it was referred to I believe by  
7 Mr. Maser in his evidence and the only reason I put it  
8 up is that it had a better picture than I could draw at  
9 the moment.

10 What it shows is the idea of how a  
11 landscape can retain its characteristics without being  
12 frozen in time. The basic idea here is that we have  
13 the same landscape in four different time intervals in  
14 this way of looking at things, and this is not intended  
15 to be a literal picture of what it would look like, but  
16 but rather a schematic view of it.

17 There might be a part of it, this central  
18 section here, which is equivalent to a park or reserve  
19 or something which is frozen in time, if you want to  
20 put it that way. It is outside of the human element.

21 The other segments around here are at  
22 various stages of forest development and in each time  
23 interval there is one in this schematic view which is  
24 taken out and harvested.

25 The other stages are at various stages of

1 regeneration and, again, schematically without going  
2 into the details here, one can see the impression of  
3 how the relative proportions of different age classes,  
4 of size and shapes and patches and so on remain  
5 constant through time, although the forest or other  
6 activities are continuing at each time interval.

7 That's what we mean by saying that there  
8 is no need to freeze a landscape in time in order to  
9 have some of its characteristics ongoing.

10 Q. Thank you. For the record I should  
11 indicate that was page 4 of the exhibit which has been  
12 marked No. 1723.

13 Dr. Middleton, in order to achieve the  
14 objective of landscape management as you have described  
15 it, what must the landscape planning approach include?

16 A. Well, as a first step it must include  
17 our ability to keep an accounting of all of the  
18 different parts out in the landscape; that is to say,  
19 it has to include as a first stage a consistent  
20 ecological land classification system covering the  
21 entire landscape.

22 Q. Why is that necessary?

23 A. Well, without this we don't have the  
24 ability to answer directly the question about whether  
25 our landscape characteristics are maintaining



1 themselves or not unless we have a consistent way which  
2 everyone agrees with for saying what is out there. We  
3 cannot know how we are affecting it except in anecdotal  
4 and qualitative ways.

5 Q. And Dr. Suffling will be providing  
6 more details on this issue.

7 Dr. Middleton, can you advise me whether  
8 or not in your opinion the tools are in place now to  
9 develop an ecological land classification system?

10 A. In my opinion, yes, they certainly  
11 are in place to develop such a system. I can refer to  
12 a couple of things.

13 First of all, going back to the ESSA  
14 document that we were discussing yesterday, that would  
15 be the 1991 ESSA report.

16 Q. That's Exhibit 1714.

17 A. Thank you. I stressed yesterday, I  
18 don't think I need to go over the same quotes again,  
19 how an ecological land classification was given as the  
20 single, major priority for the whole level of research  
21 that was being proposed there.

22 I can also refer to other agencies that  
23 use this sort of thing. Ontario Hydro, for a single  
24 example, is already using quite a sophisticated  
25 landscape planning system, going straight from

1 satellite photographs to information which is  
2 equivalent to FRI and other forest classification  
3 systems as Dr. Suffling will explain a little bit later  
4 on.

5 Q. Can I ask you to look at Exhibit 1722  
6 which is the two-page photocopy of a Hydro pamphlet on  
7 computerized landscape management.

8 Can you very brief take the Board through  
9 this pamphlet and indicate whether or not the approach  
10 outlined here has any relevance for timber management  
11 planning?

12 A. Yes, certainly in my view it does.  
13 Remember again that when we are talking about a  
14 landscape classification or a landscape planning system  
15 it doesn't breakdown as forest versus something else;  
16 we are dealing with the whole configuration of the  
17 landscape. So what is done by one agency with one view  
18 is essentially the same as what would be used for  
19 another agency, such as a forestry agency.

20 If you look on the first page -- well, it  
21 won't be obvious to you which is the first page. The  
22 section with the Ontario Hydro logo at the bottom of  
23 the page.

24 I would point out that this system known  
25 as CARS has been in use since 1972 within Ontario

1 Hydro's in-house work which has been in use for close  
2 to 20 years now. So this is not by any means an  
3 experimental technology.

4 It goes on to talk about some of what has  
5 happened in the past. Originally Ontario Hydro, as it  
6 says in the same page, developed its own software, but  
7 its emphasis is now changing to using off-the-shelf  
8 software, if you wish to call it that, because these  
9 things are now becoming commercially available which  
10 makes it all the easier for some other agency to begin  
11 it from scratch if necessary.

12 The bulk of the document just gives an  
13 idea of what's possible with this sort of system. It  
14 is really just an accounting system for, first of all,  
15 collecting information about the shape and texture and  
16 make-up of the landscape using things such as satellite  
17 data, but also to keep it in a computer system which  
18 allows any given piece of information to be picked up  
19 and manipulated at the will of the users.

20 The only other thing I would like to say  
21 about this at the moment is that one of their major  
22 uses of this system is in environmental assessments of  
23 Hydro corridors; that is to say, it has been used for a  
24 very large scale -- large area programs, for example.  
25 The current use is to determine appropriate uses for



1 Hydro transmission lines across all of northern  
2 Ontario.

3 So it is being directly applied as we  
4 speak for the area of this undertaking, taking  
5 explicitly into account what a particular human  
6 disruption such as a Hydro pole might do to the  
7 wildlife of the region using the same definitions that  
8 we are using. So it is very relevant I think as a  
9 model of what could be done.

10 Q. Thank you. Now, on page 38 of your  
11 witness statement you have indicated that once a piece  
12 of land has been mapped with an appropriate ecological  
13 land classification timber management might  
14 hypothetically do at least four different things to  
15 that piece of land.

16 I understand that you have prepared some  
17 overheads that illustrate what might occur on  
18 that piece of land?

19 A. Yes. I will just go through these  
20 very briefly, if I may.

21 I would ask you to do two things as I am  
22 showing these. The first is to remind yourself of the  
23 kind of map that our -- the area photograph that we  
24 have up there, satellite photograph, and imagine that  
25 what I am going to be showing you is a very simplified

1 version of that sort of landscape mosaic we defined  
2 earlier.

3 MR. LINDGREN: Madam Chair, we are  
4 looking at page 5 of the hard copies of the hand-outs.

5 DR. MIDDLETON: We can imagine, if you  
6 will forgive my atrocious art work, looking at a piece  
7 of landscape which will be some kilometres in size in  
8 each dimension. The scale here is something which will  
9 be variable without the principles being changed, and  
10 here we have a number of units in the landscape defined  
11 by the characteristics.

12 I have here, just for the sake of this  
13 argument, four different categories. The green dots,  
14 the green stripes, the red stripes and the red  
15 hatching, but again, please remember that this is  
16 intended to be a schematic of a much richer description  
17 of what the landscape would be like. So that's the  
18 first thing to keep in mind.

19 The second thing to keep in mind is that  
20 as I put these things up to see what is potentially to  
21 be done, notice that each of the things that I am going  
22 to talk about is absolutely straightforward in  
23 definition and immediately open to very simple  
24 manipulation and description in terms of back of the  
25 envelope kinds of things, let alone sophisticated

1 computer applications; that is to say, all of these  
2 things are measurable and quantifiable in a  
3 straightforward way once we have the original  
4 classification of the landscape.

5 MADAM CHAIR: Excuse me, Dr. Middleton.  
6 What's before?

7 DR. MIDDLETON: Before is in conjunction  
8 with after. Before is the landscape -- technology  
9 strikes again. Before is a landscape before or  
10 starting point today, shall we say, and on the bottom  
11 of each picture, which I will try to put up an "after"  
12 showing a number of different things that we might do  
13 to the landscape by our activities. It is a little bit  
14 too tricky here, so I ask you to remember the four at  
15 the top.

16 One of the first things that can be done  
17 is to eliminate one of the categories of things here  
18 and with this "after" I have gone through and imagined  
19 that we have eliminated a whole category of things, the  
20 red hatching here.

21 I am sure you have heard that the first  
22 rule of intelligent tinkering is to save all the  
23 pieces. Well, this would be an example of what would  
24 be the opposite of losing a whole piece from the  
25 landscape.

1                   This might be a number of different ways.  
2           It could be eliminating entirely something like old  
3           black spruce from a landscape. I don't want to get  
4           into the details of what this is. It is the conceptual  
5           framework to which we can put those things. So we can  
6           eliminate something entirely.

7                   Without going so know far as eliminating  
8           something, we can change the relative proportions. In  
9           the first diagram we had equal proportions of all the  
10          things, here we still have all four categories, but in  
11          one case we have actually increased the amount of  
12          landscape which has that covering on it, and  
13          correspondingly for the others we have reduced them to  
14          a smaller proportion of what they were originally. So  
15          the second category are changes, which is possible.

16                   Another category would be to add  
17          something new. Here we have got some blue dots which  
18          we didn't have in our pre-existing landscape. If, for  
19          example, we decide we want to have - I don't know -  
20          coconut plantations in the area of the undertaking, it  
21          would show up as a completely new category, or more  
22          realistically something like urban development would  
23          show up as a qualitatively new landscape which had not  
24          been there before.

25                   MADAM CHAIR: Dr. Middleton, is this the



1 same idea as the GIS mapping technique, because the  
2 Board and the parties have had a demonstration of that  
3 technology?

4 DR. MIDDLETON: A GIS system would be a  
5 tool for keeping track of these things, but it is only  
6 a tool. What I am almost finished showing is the  
7 categories of things which are possible whether or not  
8 one uses a GIS system. This is the possible changes in  
9 the landscape, that GIS is a tool for looking at them  
10 and other categories of change as well.

11 Just briefly looking at some of the  
12 others. We could also change the size of the patches  
13 in our landscape. The same areas involved, same  
14 categories, but now we have gone to very large patches,  
15 four times the area that we had originally.

16 And correspondingly, we of course could  
17 go the other way as well and reduce the average size.  
18 Again, not changing the relatively areas and not  
19 changing the kinds of categories, but changing the  
20 size of the patches.

21 Just two more for the sake of  
22 completeness. Here just concentrating on one, the  
23 others would be there, but just to make the point clear  
24 I have only put on one. A change in the separation  
25 between patches is somewhat a more subtle point, but

1 one which we think might be very significant in terms  
2 of populations of wildlife out there.

3 Instead of, in our original case, having  
4 similar -- patches of similar kinds of stuff being  
5 closely adjacent to each other, now they have a wider  
6 separation which might have significance for the long  
7 time survival of the species that are within it.

8 Just one last one. One that I have in  
9 fact neglected to put in my witness statement, but  
10 Professor Suffling mentioned it and I will put it up  
11 just for the sake of completeness. Changing the shape  
12 of the patches, changing the relative length to width  
13 or area to interior ratios without changing the other  
14 things.

15 So just to repeat, those are schematic  
16 representations of what's possible. Notice that they  
17 are all entirely straightforward sorts of things to  
18 measure, to keep track, to record even on a satellite  
19 view scale of things once we have done that original  
20 step of having a system which allows us to  
21 unambiguously classify the types of landscape units  
22 that we have out there.

23 MR. LINDGREN: Q. Now, can the various  
24 changes that you have described occur as a result of  
25 timber management activities?

1 DR. MIDDLETON: A. Yes, in different  
2 characteristics. In fact, one of the goals of this  
3 kind of system, of an adequate system as defined by the  
4 ESSA report or anyone else that thinks about it, would  
5 be that the sorts of things we do with forestry must be  
6 picked up by this kind of classification system; if  
7 not, then it is not a tool for understanding the impact  
8 of forestry on our landscape.

9 That's not to say, of course, that  
10 forestry will inevitably lead to any of these kinds of  
11 changes. As we saw earlier, it is possible to think of  
12 a landscape which remains constant for all of those  
13 characteristics even as forestry continues through  
14 time, like the first overhead I showed this morning  
15 where you have to have at least a tool which will pick  
16 up anything which shows that we are deviating from  
17 that.

18 Q. In general, can those types of  
19 changes adversely affect the abundance or distribution  
20 or occurrence of wildlife species?

21 A. Certainly some categories of them can  
22 in principle. Again, I want to stress that I am not  
23 saying that I had "x", "y" and "z" example for each of  
24 them having been done.

25 To be honest, I don't know at the moment

1 whether changes that have been made to the Ontario  
2 landscape have had deleterious effects on this, that or  
3 other species.

4 My main reason for bringing all of this  
5 up is we want to, starting from what we have today, do  
6 things in such a way that we don't risk those changes  
7 into the future. The first rule, again, if we are  
8 going to make changes to our landscape is to do it in  
9 such a way as the Ministry has described it, that we  
10 mimic the natural disturbance regime as closely as  
11 possible which, in the terms I have been using, is we  
12 do forestry in such a way that these characteristics do  
13 not change significantly through time.

14 Q. Thank you. I would like to refer you  
15 to page 39 of your witness statements and in the first  
16 sentence we find a statement that:

17 "Under the ecological land classification  
18 system, ill defined and controversial  
19 terms like old growth and clearcut  
20 are replaced by unambiguous and  
21 quantitative labels..." and the example  
22 that you use is landscape unit type 3B.

23 Now, during the scoping session the Board  
24 expressed some difficulty about using terminology such  
25 as landscape unit type 3B since that term might be

1 meaningless to the public, and can I ask you why is  
2 that sort of terminology necessary for landscape  
3 managers and how does it makes explicit goals possible  
4 for landscape management?

5 A. Yes. I will clarify that what I was  
6 saying there was this would be an extra label to be put  
7 on whatever type of landscape unit that we are talking  
8 about. It is similar -- an analogy would be the way  
9 that we name species.

10 If you and I are talking about a skinny,  
11 slimy thing, we will probably call it a worm and we  
12 will do that all the time and we would continue do  
13 that, but if I am doing some scientific work with a  
14 worm, I would be careful to label it as Apporrectodea  
15 trapezoides or Eisenia foetida or whatever, names that  
16 are meaningless to the vast majority people and they  
17 are used only in very specific circumstances where it  
18 is essential to be precise about that which one is  
19 referring to.

20 Similarly, with the landscape scale  
21 things. I am sure that all of us will continue to go  
22 on speaking, even if this framework is taken out, of  
23 old growth and clearcuts and so on.

24 The necessity, though, is to have some  
25 fall-back position which is less ambiguous than those



1 terms. If, for example, we are going to be making some  
2 management prescription about old growth, with all good  
3 faith in the world, one manager might say: Ah, that  
4 means we have to deal with this small area of our  
5 management unit; another manager, equally goodwill,  
6 looking at the same would say: That means we have to  
7 deal with this; and as third might say: Well, I don't  
8 have to deal with that at all because we don't have any  
9 here.

10 Obviously we can't make detailed and  
11 adaptive plans if we have that kind of ambiguity about  
12 what we are talking about in the first place. That is  
13 why within an ecological classification system there  
14 will be an unambiguous definition which will probably  
15 be a meaningless set of terms to most people, but will  
16 have the goal in those very specific cases of making  
17 unambiguous of what we are talking about. I certainly  
18 don't propose this will replace words like old growth  
19 and so on in the public or even in most times for the  
20 professional vocabulary.

21 Q. I would like to refer you to the next  
22 section of your evidence which is entitled the  
23 Sustainability Landscape and we find that on pages 40  
24 to 42 of the witness statement.

25 Can I ask you to begin by looking at FFT

1 condition No. 26(1) which is found on page 21 of the  
2 terms and conditions. Paragraph 26(1) states that:

3 "The MNR shall develop and implement a  
4 landscape planning and management system  
5 to enable the MNR to identify, perpetuate  
6 and manage all ecosystem elements,  
7 landscape units in proportion to their  
8 occurrence and spacial configuration in  
9 the existing landscape with a view to  
10 ultimately replicating forest processes  
11 and conditions that existed prior to  
12 modern fire suppression, chemical  
13 tending, large area clearcutting within  
14 the area of the undertaking."

15 Dr. Middleton, can I first ask you to  
16 explain what is meant by the term "ecosystem element"  
17 and can you explain why FFT is proposing that landscape  
18 management be done in relation to existing occurrences  
19 and spacial distributions with a view to replicating  
20 pre-existing forest conditions?

21 A. Yes. An ecosystem element would be  
22 the smallest colour patch, if you want, in one of my  
23 diagrams or on here. It would be the basic tile in the  
24 mosaic of the landscape.

25 I should say in passing that I was myself

1       rather sloppy in the use of those terms in the witness  
2       statement, a lot of different nomenclatures show up.  
3       One of the first tasks for a research program would be  
4       to make us all be consistent with how to label all of  
5       these things.

6               Now, the reason that we are talking about  
7       having this in relationship to the current landscape is  
8       one of reality. If I were sitting down as a  
9       theoretically ecologist, my first thought would be - in  
10      fact, was - to say we should manage these things in  
11      relationship to the existing landscape before the human  
12      element did -- made any changes, if in fact it has made  
13      any changes to the characteristics that we are talking  
14      about.

15             However, the reality is that getting  
16      information, getting reliable data about that original  
17      landscape is a very, very daunting task. We have some  
18      ways of getting such data for some places, for some  
19      things, but the reality is that our starting point in  
20      which we know anything at all in detail is what we have  
21      today.

22             So the first task in our revised view is  
23      to start from our existing landscape and manage future  
24      changes in such a way that we do not do any  
25      irreversible changes to what we have now; and then as a

1 second stage, to take advantage of any information that  
2 does come out in the future about what the pre-existing  
3 landscape was like and if, in fact, there have been  
4 deleterious changes from that original landscape to  
5 gradually incorporate movement back to the original  
6 landscape into our management plans.

7 Q. On that point, can I refer you to  
8 Exhibit 1721 which is the three-page extract from the  
9 Richard Plochmann article entitled The Forests of  
10 Central Europe: A Changing View.

11 MADAM CHAIR: Which number is that, Mr.  
12 Lindgren?

13 MR. LINDGREN: 1721.

14 MADAM CHAIR: Thank you.

15 MR. LINDGREN: Q. Dr. Middleton, I  
16 understand that you had some comments in relation to  
17 the diagram which we find on the last page of this  
18 excerpt.

19 DR. MIDDLETON: A. Yes. This is an  
20 illustration of what I was just trying to say but with  
21 some actual data from a European forest, and what we  
22 have here are the three case that we have just been  
23 referring to.

24 In the middle, we have the existing  
25 situation. The planned forest for the future is to be

1 different from what we have at the moment and the  
2 differences are guided by that third column, Column A,  
3 which is information about what was there in the past.  
4 If you just look in the first column below that there  
5 is a nice explanation of the thinking behind it. I can  
6 briefly quote from it:

7 "The amount of pine, spruce and Douglas  
8 fire rose from about 20 per cent to over  
9 90 per cent."

10 That is from the original forest to the  
11 existing forest. Column C shows you the planned forest  
12 composition in the future:

13 "The conifers will be reduced to less  
14 than 50 per cent and where possible they  
15 will be mature hardwoods."

16 And the important point:

17 "The naturally mixed hardwood stands  
18 will return in substantial areas. The  
19 forest of the future will not be the  
20 natural one, but it will come much closer  
21 than today's forests."

22 Now, obviously the details here about  
23 pines and Douglas fir and hardwoods and so on are not  
24 relevant to Ontario directly, but the principle that  
25 one can make use of information from the past to guide



1 the future landscape in such a way that we return  
2 closer to a natural condition eventually is -- that's  
3 the idea we are trying to put across here without  
4 having to stop all work until we have complete  
5 information about the past.

6 Q. To obtain information about the past,  
7 is it necessary to reconstruct the historical record of  
8 the forest?

9 A. That would be a very valuable thing  
10 to do. It is a fascinating research exercise and I  
11 believe the ESSA report puts that as one of many tasks  
12 that it says would be useful.

13 Part of that would be simply collating  
14 all the information which is available from individual  
15 sites. So in the first instance some progress could be  
16 made at relatively low cost.

17 I would go on to say, though, this would  
18 not be my first priority for reserve. It is a  
19 fascinating thing. As I say, it will eventually be  
20 useful, but the thrust of what we are suggesting is  
21 that even in the complete absence of those data we  
22 could implement this program based on the existing  
23 landscape. It is not a stumbling block to the whole  
24 idea.

25 Q. Thank you. Madam Chair, the

1 reference to the ESSA Document is found on page 49 of  
2 Exhibit 1714.

3 Dr. Middleton, on page 41 of your witness  
4 statement you set out some order of magnitude criteria  
5 for the sustainable landscape.

6 Before we discuss those, there are some  
7 landscape ecology concepts that I think we should  
8 clarify or define. The first is, what is meant by the  
9 phrase edge and the phrase ecotone?

10 A. These both refer to the situation  
11 where one type of stand, for example a forested stand,  
12 is quite adjacent to quite a different one. Either one  
13 of a different age or more clearly still if we have a  
14 forest surrounded by cut area or bt grass land or  
15 something of that sort.

16 It is a biological reality that the  
17 living conditions in the edge between the two of them  
18 is significantly different from that of the rest of the  
19 forest or the rest of the open field, for that matter.  
20 These factors can include things like micro-climate;  
21 that is to say, the relative humidity might go down  
22 compared -- or it might be different in the variable  
23 compared to the centre of the forest, the difference in  
24 biotic factors like predation, a whole list of things  
25 which, to be honest, as biologists, we were not

1 entirely sure we know the whole mix of.

2 But the reality is that the edge of the  
3 forest adjacent to a field or other age class is  
4 significantly different for some organisms than the  
5 rest of it. What this means is that if one is  
6 concerned about organisms that require the forest  
7 interior conditions, only part of any identified chunk  
8 of forest as seen from the air will be suitable habitat  
9 for them. And to the extent that this effect can be  
10 significant for some organisms, it might be that 50  
11 metres next to the opening is unsuitable and there have  
12 been estimates as high 600 metres for some organisms,  
13 although I think that is an extreme value.

14 What this means is that keeping track of  
15 the amount of edge between different types of landscape  
16 units is something which will be of interest to people  
17 that are trying to keep wildlife species in the  
18 landscape. Having a very large amount of edge will  
19 benefit some species, but it will work to the detriment  
20 of other species if it means that the forest interior  
21 is thereby reduced significantly or eliminated.

22 Q. In your opinion, does the provision  
23 of more edge from timber management activity  
24 necessarily benefit all wildlife species?

25 A. No, it certainly won't benefit all

1 wildlife species. It will benefit some and be  
2 detrimental to others.

3 A single provision of providing lots of  
4 edge will categorically not be a good prescription for  
5 all the species that live there. In fact, the species  
6 likely to be most sensitive to human impacts on the  
7 environment are likely to be those which require the  
8 interior of large undisturbed chunks and those are  
9 precisely the species which will be harmed by a  
10 provision of extra edge.

11 Q. Are you referring to what is  
12 sometimes known as area sensitive or forest interior  
13 species?

14 A. These are both names that have been  
15 used for the thing I'm talking about, yes.

16 Q. The next term I would like you to  
17 clarify is connectivity. Can you briefly define that  
18 term and relate it to the concept of forest  
19 fragmentation?

20 A. When we break up a forest into -- if  
21 we started with a continuous, expansive forest and  
22 through some activity broke that up into more or less  
23 isolated blocks of forest surrounded by different kinds  
24 of environment, like cuts or open grass lands or  
25 whatever, we have something which looks very much like

1 islands of forests in a sea of something else and there  
2 is much biological theory and evidence to show that  
3 that can potentially lead to problems for the species  
4 that live in those isolated chunks if in fact they are  
5 isolated.

6 I mentioned yesterday that even the  
7 largest national parks are insufficiently large to  
8 ensure survival of most species and simply considering  
9 what is inside their boundaries, and here we are  
10 talking about things measured on the thousands of  
11 square kilometres level and that they in fact get  
12 greater when we get smaller chunks. The islands of  
13 habitat must interact with each other over a relatively  
14 long time span.

15 Now, connectivity is a name that's given  
16 to the degree to which the more or less isolated  
17 islands of habitat are able to interact with each -- or  
18 rather, the species within them are able to interact  
19 with each other. In the simplest instance, this means  
20 things like actual, physical corridors, as they are  
21 called, between the two of them. Perhaps forest along  
22 a stream joining to chunks of remaining forest. That's  
23 one version of connectivity.

24 Connectivity does not necessarily have to  
25 deal with such things. It is really a functional



1       measure of the degree to which organisms are able to  
2       get one from one island of habitat to another and  
3       certainly in some circumstances for some species this  
4       does not necessary mean an absolutely physical corridor  
5       between the two. It might mean a suitably low level of  
6       separation between adjacent patches and it will also  
7       have to do with the character of the intervening  
8       habitat.

9                   It is not a black and white concept as it  
10       tends to be when we are dealing with terrestrial  
11       islands surrounded by salt water, for example.

12                  Q. Now, you mentioned a moment ago that  
13       cutting might result in the fragmentation of the  
14       landscape. Can I ask you, in general can roads and  
15       water crossings also act as a barrier by fragmenting  
16       contiguous habitat?

17                  A. Potentially so for some organisms.  
18       There have been some studies done, unfortunately the  
19       ones I know of are in southern Ontario, looking at  
20       roads as potential barriers to movement between the two  
21       sides. I think this is an area which needs a lot more  
22       study to see what the implications are for which  
23       species, but certainly in principle this can have the  
24       effect of decreasing connectivity by interposting a  
25       barrier.

1 Q. In general, can fragmentation lead to  
2 local extinctions and loss of biodiversity?

3 A. Yes, I think it's unequivocalable  
4 that in certain circumstances that will occur. I can  
5 give an example. Unfortunately not from Ontario again,  
6 but at least from Canada this time.

7 A few years ago some people looked at  
8 national parks in western North America, both Canada  
9 and the United States, and these are the big flag ship  
10 national path, relatively undisturbed, quite large, and  
11 they looked at groups of mammals among the more mobile  
12 species out there.

13 What they found was that with one  
14 exception every park that they looked at had had local  
15 extinctions of at least one of these species of mammals  
16 over the time period that they studied which, if I  
17 recall correctly, was something like 40 to 50 years.

18 So even in these very large places with  
19 the more mobile section of the wildlife out there we  
20 can see these local extinctions. They did not become  
21 absolute extinctions precisely because it was possible  
22 for new immigrants to come in, it was still possible to  
23 move from one to another and these local extinctions  
24 were made good by there natural reimmigration.

25 So, yes, to answer your first question

1 fragmentation without this connectivity can lead to  
2 local extinctions.

3 Q. The final terminology that I would  
4 like to put to you are the concepts of dispersion and  
5 interspersion. Can you briefly explain which each of  
6 the concepts entail and can you indicate what their  
7 significance is in terms of landscape management?

8 A. Yes. I think Dr. Suffling will talk  
9 about these terms in a little more detail later on.

10 These go back to the diagrams I showed  
11 earlier having to do with how the different units of  
12 the same type of thing, the red stripes for example in  
13 my diagram, how they are spread through the landscape.

14 It does make a difference, certainly in  
15 theory and probably in practice, for many species  
16 whether these are all clustered up in one corner of the  
17 unit or spread throughout the thing.

18 I am going to use another analogy.  
19 Imagine that we were having a redevelopment of your  
20 town or city and before the development we had "x"  
21 number of libraries and after the fact we had the same  
22 number of libraries or fruit stores or whatever, we  
23 would say that's fine, but it will make a difference  
24 whether we have all five libraries on the same block up  
25 in one corner as compared to having them uniformly

1 distributed amongst the rest of the unit which is a  
2 functional difference on the spacial organization and  
3 pattern of these things. That's what I meant by those  
4 terms.

5 Q. Thank you. I would now like to  
6 return to page 41 of the witness statement, and we see  
7 at the bottom of the page you have set out certain  
8 criteria in terms of managing the landscape, and again  
9 Dr. Suffling will provide more details on each of these  
10 criteria, but, Dr. Middleton, can you briefly indicate  
11 what these criteria are based on?

12 A. Yes. First let me remind you again  
13 that if we were absolutely successful in putting into  
14 practice that goal; that the forestry regime would  
15 mimic to the greatest extent possible the natural  
16 disturbance regime, then there would be no difference  
17 between the natural landscape and the landscape of  
18 forest management. What these figures refer to are  
19 what kind of deviations from that ideal would still be  
20 considered acceptable.

21 I want to also stress that these are  
22 going a step beyond what we have said so far. What we  
23 have done so far is talk about an approach, a set of  
24 principles for looking at the whole problem. These are  
25 going further and suggesting starting points for the

1 actual details, what the landscape would look like, and  
2 I think it is important to recognize these things are  
3 more likely to be open to change and further  
4 elaboration through things like the ESSA procedure than  
5 are the parts that have come earlier.

6 Having said that, let me tell you  
7 approximately where these comes from.

8 Remind me, was there an interrogatory  
9 filed with the details in it? I think there was.

10 Q. I believe that you might be referring  
11 to page 8 of Exhibit 1717A which is interrogatory No.  
12 40 from--

13 A. Which page, please?

14 Q. --OFAH. This is page 8 of the  
15 interrogatory hand-out.

16 A. Yes, thank you. That's the one I was  
17 looking for, just so that people recognize this has  
18 been written down for reference later.

19 Okay. Let me go through what my  
20 reasoning was for these. First of all:

21 "No type of landscape unit will be  
22 eliminated."

23 This one is a more qualitative one and it  
24 goes back to that basic rule that if you are going to  
25 tinker with things, the first rule would not be to lose



1 any of the pieces. There is really no quantitative  
2 argument there.

3 The second one:

4 "No type of landscape unit will be  
5 reduced to less than 20 per cent of its  
6 original area nor increased to more than  
7 500 per cent of its original area."

8 These are setting, in my opinion, very  
9 wide ranges for fluctuation. These are fivefold  
10 changes and they are really just the inverse; one of  
11 the other. Fivefold changes from natural landscape to  
12 the human dominated landscape.

13 The logic here is sort of based on  
14 another figure of parks and reserves. We have seen  
15 earlier that a system of parks and reserves is thought  
16 to require something in the order of 10 to 12 per cent  
17 of the landscape. If -- and we know also for that sort  
18 of iceberg argument I used earlier that that is not  
19 enough in itself.

20 So if we take that 10 per cent figure and  
21 acknowledge that that's not sufficient enough, 20 per  
22 cent as a rough estimate of what an acceptable minimum  
23 would be for the whole landscape at one end of the  
24 continuum and 500 per cent simply being the opposite,  
25 being inverse in the opposite direction.

1                   The third one:

2                   "No novel or unnatural type of landscape  
3                   unit will occupy more than 10 per cent of  
4                   the land."

5                   The logic here is, again, as a starting  
6                   point based on the park and reserve figure of 10 to 12  
7                   per cent. These completely novel part of the  
8                   landscape; that is, something which is quite different  
9                   from the types of things that are native species that  
10                  have evolved to have as part of their habitat, could be  
11                  considered functionally as something like an anti-park.

12                  It has the opposite effect of being the  
13                  other end of the continuum from the natural  
14                  environment, and as a starting point having equal  
15                  constraints on this. The 10 to 12 per cent figures was  
16                  the logic here.

17                  Q. Dr. Middleton, perhaps before you go  
18                  on, you indicated a novel landscape unit could include  
19                  things like plantations of exotic species or pieces of  
20                  land so managed and after a clearcut and a herbicide  
21                  application perhaps that is no longer analogous to any  
22                  natural part of the landscape.

23                  Why do you say that plantations so  
24                  managed would not longer be considered part of the  
25                  natural landscape?

1                   A. If, in fact -- and again this is a  
2 hypothetical thing rather than saying this is happening  
3 today in. If, in fact, we changed the regeneration of  
4 a piece of land such that the only similarity between  
5 that and the natural environment was the species of  
6 tree there, if for example we gotten rid of all the  
7 understory, chemically changed the decomposition  
8 system, got rid of the down wood and so on that are  
9 habitat to a whole range of invertebrates and  
10 micro-organisms, that it might be that for the vast  
11 majority of the species in this landscape this would be  
12 unrecognizable as a part of the environment that they  
13 had seen before, a biological desert from their  
14 perspective.

15                   If that in fact were the case, then the  
16 fact that it had the specie of tree would probably be  
17 insufficient to say that it was part of the original  
18 landscape mosaic.

19                   The next one has to do the average size  
20 of patches and not changing by a factor of two in  
21 either direction. The factor of two is, to be honest,  
22 just something to get the argument started. Again, in  
23 recognition of the fact that that if we were successful  
24 in putting our ideals forward the factor here would be  
25 zero; no change in patch size.

1                   The average separation between patches of  
2                   the same type not increased by more than a factor of  
3                   two. There was, in fact, a further interrogatory which  
4                   asked why this was a single direction, why it said only  
5                   increase and not decrease. I am perfectly happy to  
6                   change that to be either increased or decreased by a  
7                   factor of two.

8                   The reason it was only increased was  
9                   because the increase in isolation is the thing which I  
10                  am aware of being a potential problem in most  
11                  conservation issues and that's the one I was focusing  
12                  on. It is quite right, however, to say that there  
13                  might be circumstances in which decreasing the  
14                  separation between patches might also be considered a  
15                  problem. So that should probably be modified.

16                 Then the final one on the list was that  
17                 all of these goals would be for Ontario as a whole, but  
18                 also for each smaller area down to the level of  
19                 ecosection as defined by the system that we are going  
20                 to be dealing with.

21                 The logic here was one that Dr. Bendell  
22                 referred to repeatedly yesterday. It would probably  
23                 make a lot -- certainly it would make a lot of  
24                 difference if, for example, all the jack pine in  
25                 Ontario was going to be in the northwest and all the

1 black spruce in Ontario was going to be in the  
2 southeast or something of that sort. We might  
3 potentially meet all of these above goals, but  
4 completely rearrange the structure of Ontario in such a  
5 way that it would probably not appeal to any of the  
6 parties to this assessment. So it is important to  
7 specify this for smaller areas as well.

8 Q. Thank you. Now, on page 42 at the  
9 top you indicate that a landscape with the  
10 characteristics that you have described can support a  
11 sustainable forest industry in co-existence with  
12 healthy populations of all native species.

13 Why do you say that?

14 A. Well, the argument is something like  
15 this: That we really only got three possibilities  
16 here. We could say, first of all, that we are going to  
17 eliminate forestry from the landscape. I don't think  
18 anybody is seriously considering that at all. We have  
19 ruled that one out.

20 The second one would be that we have got  
21 forestry of a kind that leads to irreversible changes  
22 either in the Industry or populations of wildlife or  
23 whatever; that is to say, it is not stainable. Again,  
24 I think that would be completely at odds to the  
25 principles that have been brought forward by virtually



1 all the parties in this proceeding.

2 That leaves really only one possibility  
3 which is that we have forestry of a kind which does not  
4 lead to irreversible changes in the landscape, does not  
5 lead to irreversible changes in the economic status of  
6 the Industry and does not lead to irreversible changes  
7 in the status of any wildlife population.

8 It is really the only conceptual way of  
9 looking at this which will allow all our goals to be  
10 brought together at one time.

11 Q. I have just been reminded by the note  
12 takers if perhaps it might be possible for you to slow  
13 down a bit.

14 A. Please remind me again.

15 Q. Now, the criteria that you have  
16 described are reproduced in term and condition 26(1)(b)  
17 which is found on page 22 of the terms and conditions.

18 Do you support that particular condition?

19 A. Certainly. Again, with the proviso  
20 that I certainly recognize these as starting points for  
21 discussion about it based on current knowledge, and it  
22 is again my understanding that the procedure of  
23 research that is being recommended by the draft ESSA  
24 report is precisely to put some intensive thought into  
25 exactly these sorts of things.

1 I am confident that our ability to  
2 specify these things more clearly and consistently will  
3 improve in the near future.

4 Q. I would like to turn to the final  
5 section of your witness statement which is found on  
6 pages 42 and 43. There you indicate how the landscape  
7 management system would work in practice.

8 Again, Dr. Suffling will provide more  
9 details on the implementation of the landscape  
10 management approach, but, Dr. Middleton, can I ask you  
11 to summarize your view on how the system can be applied  
12 in practice?

13 A. Yes. Again, I would stress that I am  
14 not trying to do this from scratch. Really what I am  
15 doing is putting forward my synthesis of what I am  
16 hearing from many other people in these hearings and in  
17 the ESSA procedure.

18 We have seen that the tools for doing the  
19 first stages of this are already available to us. We  
20 have seen that the -- as stressed by Dr. Baskerville,  
21 for example, that whenever we do something to the  
22 landscape we are doing it with the same basic  
23 procedure, whether our goal is immediately for timber  
24 or for wildlife or for socio-economic values or  
25 anything else. It is one landscape and, thus, one

1 planning system to -- it needs to be there at one level  
2 to bring all these things together. You can't do one  
3 without the other.

4 We have also seen that it is a central  
5 principle, and I think an absolutely right one, that  
6 there is in principle the possibility to have a forest  
7 system which mimics the natural disturbance regime.

8 Bringing all those things together, the  
9 way that I think we would all agree with, to do this is  
10 to ensure that we have a landscape where the new regime  
11 of forest management is such that it mimics the natural  
12 regime and this would immediately bring the desired  
13 output for whatever group of interest that we are  
14 looking at.

15 Reminding ourselves that this is all in  
16 the context of other things. It is one tool amongst  
17 many. Just to stress one, we have a two-stage  
18 structure that we are putting together here. We are  
19 not saying this will do all our tasks for wildlife. We  
20 have got a task that it fits together with other  
21 species information when that's available and, of  
22 course, other economic information, socio-economic  
23 information, forestry information and so on, but all of  
24 this extra information fitting into a unified framework  
25 which is the landscape approach.

1 Q. In your opinion, Dr. Middleton, is  
2 landscape management practical and implementable in  
3 Ontario?

4 A. Yes, in my opinion it is and I have  
5 been impressed by the extent to which the workshop that  
6 ESSA has put together has brought the same opinion from  
7 people of all spectrum -- all parts of the spectrum of  
8 interest in the issue.

9 Q. In your opinion is landscape  
10 management the direction that Ontario should be heading  
11 towards?

12 A. I certainly think it should be part  
13 of the way that we manage forests in Ontario.  
14 Absolutely.

15 MR. LINDGREN: Thank you, Madam Chair,  
16 those are my questions for Dr. Middleton.

17 Unless the other Board has further  
18 questions, at this time I would like to move on to Dr.  
19 Suffling.

20 MADAM CHAIR: Go ahead, Mr. Lindgren.

21 MR. LINDGREN: Thank you. Perhaps before  
22 I do, I have four new exhibits to be marked in relation  
23 to Dr. Suffling's evidence.

24 The first is an article by Dr. Suffling  
25 entitled Climate Change and Boreal Forest Fires in

Phenoscandia, that's central Canada, and it is dated  
June 1990 and it consists of 25 pages.

MADAM CHAIR: That will be Exhibit 1725.

---EXHIBIT NO. 1725: Twenty-five page article by Dr.  
Suffling entitled Climate Change  
and Boreal Forest Fires in  
Phenoscandia, dated June  
1990.

MR. LINDGREN: The next exhibit, Madam  
Chair, is another article by Dr. Suffling entitled  
Catastrophic Disturbance and Landscape Diversity: The  
Implications of Fire Control and Climate Change in  
Subarctic Forests and it is dated May 1987 and it  
appears in the proceedings of the First Symposium of  
the Canadian Society for Landscape Ecology and  
management.

MADAM CHAIR: This will be Exhibit 1726.

How many pages, Mr. Lindgren?

MR. LINDGREN: I haven't counted the  
pages, Madam Chair. I will do so at the break.

---EXHIBIT NO. 1726: Article by Dr. Suffling entitled  
Catastrophic Disturbance and  
Landscape Diversity: The  
Implications of Fire Control and  
Climate Change in Subarctic  
Forests, dated May 1987.

MR. LINDGREN: The next article is by Dr.  
Suffling, Catherine Lihou and Evette Moran, it is  
entitled Control of Landscape Diversity by Catastrophic



1 Disturbance: A Theory and a Case Study of Fire in a  
2 Canadian Boreal Forest and it appears in Volume 12 of  
3 Environmental Management, pages 73 to 78.

4 MADAM CHAIR: That will Exhibit 1727.

5 ---EXHIBIT NO. 1727: Article by Dr. Suffling,  
6 Catherine Lihou and Evette Moran  
7 entitled Control of Landscape  
8 Diversity by Catastrophic  
Disturbance: A Theory and a Case  
Study of Fire in a Canadian  
Boreal Forest.

9 MR. LINDGREN: The final document, Madam  
10 Chair, is an article entitled: GIS, FORMAN: A Next  
11 Generation Wood Supply Model by Glen Jordan and Emin  
12 Baskent and it is a paper that was delivered at the GIS  
13 '91 conference in Vancouver in the week of February  
14 12th to the 15th, 1991.

15 MADAM CHAIR: That will be Exhibit 1729.  
16 -- no, 28. The Jordan and Baskent article will be  
17 Exhibit 1728.

18 MR. LINDGREN: Thank you.

19 ---EXHIBIT NO. 1728: Article by Glen Jordan and Emin  
20 Baskent entitled: GIS, FORMAN:  
21 A Next Generation Wood Supply  
22 Model, a paper delivered at the  
GIS '91 conference in Vancouver  
in the week of February 12th to  
the 15th, 1991.

23 MR. LINDGREN: Madam Chair, Dr.  
24 Suffling's evidence commences at page 48 of the witness  
25 statement and his section is entitled Ecosystem Supply

1 Analysis.

2 Q. Dr. Suffling, I would like to begin  
3 by asking you to briefly describe the main themes of  
4 your evidence.

5 DR. SUFFLING: A. Okay. I have an  
6 overhead here which summarizes some of these matters.

7 Q. Sorry to interrupt.

8 Madam Chair, we do have hard copies of  
9 these overheads.

10 DR. SUFFLING: I hope you will excuse me  
11 using a lot of overheads, but I have the writing style  
12 of a chimpanzee and it wouldn't help matters if I tried  
13 to write here.

14 Basically what I have to talk about are  
15 three topics. The first is the idea of managing for  
16 diversity. I want to challenge the idea which David  
17 Euler raised, that looking at diversity as an objective  
18 in the landscape is somehow out of date or  
19 inappropriate.

20 Secondly, I want to look at landscape as  
21 dynamic mosaic. John Middleton has already introduced  
22 this topic, so I might be able to cut this fairly  
23 short.

24 The third topic to be looked at is  
25 diversity in the landscape, how to describe it and how

1 to manage it. So let's look at the first of these to  
2 start with.

3 First of all, managing for diversity is a  
4 current concept. Indeed it is a growing concept. Now,  
5 I know being trendy is not necessarily always the best  
6 thing in the world, trends come and go, but at the same  
7 time there is a long-term consensus that managing  
8 landscapes for their diversity and related matters is  
9 an appropriate thing to do.

10 It's a consensus that, in fact, has been  
11 growing since some very early work in Czechoslovakia,  
12 Holland and Germany in the 1930's and nobody really  
13 took very much notice of it I think because of language  
14 problems until it hit the U.S. scientific community,  
15 and then with their publishing power it has been very  
16 widely accepted in recent years and there is a lot of  
17 exciting working being done in Canada on this kind of  
18 topic both within government and in academia and other  
19 areas many.

20 Managing for diversity is realistic  
21 because one can, in fact, set specific goals. It  
22 needn't be wishy washy, it needn't be high in the sky;  
23 it can be a very practical activity.

24 The third point in this topic is that  
25 managing for diversity can be effective. It is

1 effective in a way that looking at one or two featured  
2 species is not effective because the best wood in the  
3 world, although that might be good for the individual  
4 species, it might be good for a number of species that  
5 have the same habitat requirements, it will not care  
6 for or nurture all of the organisms in the landscape.

7 And it is effective because if you then  
8 counter that argument by increasing the number of  
9 featured species or indicator species to 5 or 20 or  
10 100, then the task of looking after those species  
11 becomes absolutely unmanageable. It becomes  
12 unmanageable scientifically and logistically and  
13 probably economically so, too.

14 So coming on to the second topic here,  
15 the landscape is a dynamic mosaic. As John Middleton  
16 has pointed out, this is a topic of growing interest.  
17 The dynamics of the landscape, the pattern of change  
18 through succession from, let's say, weedy communities  
19 to shrub communities to a closed forest and eventually  
20 to an old old growth forest is one underlying dynamic  
21 or driving force in the mosaic.

22 The other one is the pattern of  
23 disturbance. Superimposed on an underlying geological  
24 or soil pattern, that pattern of disturbance can come  
25 from wildfire, from insect attack in very simple



1 forests and from windthrow, and then latterly of course  
2 from clearance for agriculture and from logging and  
3 other forestry management activities.

4 Now, underlying this idea of a mosaic is  
5 the concept of fire as a disturbance factor. Fire  
6 because it is even now probably the most important in  
7 terms of area disturbance that we have in Canada and  
8 fire because it is a very motive subject and it has  
9 shaped peoples' attitudes to disturbance generally.

10 Now, initially we have the sort of Smokey  
11 the Bear era. Fires are natural. Let's get rid of it,  
12 it kills baby deers in the woods and you can put up  
13 posters with the foresters in tin hats carrying young  
14 animals out the wood. It was a very effective sort of  
15 mental image that took hold of the public and indeed  
16 with professionals and they were comfortable with it  
17 for a long time. Essentially it is a European attitude  
18 towards fire or natural disturbance.

19 Then coming from a number of scientific  
20 researchers, I might point particularly some work by  
21 Hintzelman from Minnesota. You have a countervailing  
22 sort of thrust or idea. Fire is normal. Fire creates  
23 a landscape in the equilibrium and the best analogy  
24 that I have for this is something like watching a pot  
25 of thick pea soup boiling. At any one time there are



1 bubbles forming on the surface of the soup, there are  
2 bubbles popping and there are bubbles that have just  
3 popped, but if you come back to the soup after five  
4 minutes you have still got the same picture there, the  
5 same dynamic mosaic across the surface and so it is  
6 with the landscape.

7 Now, very, very recently -- and I would  
8 hasten to say that this is probably not the generally  
9 accepted idea, but it is growing in its acceptance, is  
10 the idea that fire is natural, there is a mosaic, it is  
11 dynamic, but the amount of the fire that you have  
12 fluctuates over time and so, too, does the amount of  
13 logging. So that one tends to get bursts or pulses of  
14 fire.

15 And those terrible fires that we saw in  
16 Yellowstone, and I use terrible in the old sense of the  
17 word, as it is used in Shakespeare and in the Bible,  
18 those terrible fires were probably an outburst that was  
19 to be expected. Bill Romey in Wyoming was predicting  
20 such a big set of fires just three or four years before  
21 they happened. Some of his friends are going around  
22 saying he started them just to prove a point.

23 He reckons that in Yellowstone, for  
24 instance, every 3- our 400 years you will get such a  
25 big outburst of fire and he is looking into the reasons

1 for that now.

2 Now, we shouldn't, as a matter of  
3 management concerns, we shouldn't exaggerate natural  
4 fluctuations. I don't know mean we shouldn't talk  
5 about them in an exaggerated way. I mean that we  
6 shouldn't do things that make those natural  
7 fluctuations more extreme and the reason for that is  
8 that we might end up wiping out given landscapes  
9 species that we don't want to see disappear because  
10 when we add logging to fire perhaps we will end up with  
11 too much disturbance for some species to survive.

12 The last point in this section is that we  
13 are not all looking for the same equilibrium state,  
14 even if there is an equilibrium in the landscape.

15 MR. MARTEL: Could I ask you a question  
16 just before you go on?

17 DR. SUFFLING: Yes.

18 MR. MARTEL: Would you in your process  
19 continue to fight fire then or would you just let --

20 DR. SUFFLING: Most certainly.

21 MR. MARTEL: You wouldn't let nature just  
22 take its course then?

23 DR. SUFFLING: I would like to see that  
24 happen in certain selected landscapes and they have to  
25 to be very large landscapes such as Yellowstone.

1                   Having said that, I have some concerns  
2           about the effect of climate warming in the future. I  
3           am not sure that is a policy that we will able to  
4           follow indefinitely because we have always regarded  
5           climate as something natural, not imposed upon the  
6           earth by people and now we are beginning to find that  
7           that perhaps will not be the case in the future. So  
8           that is something that people barely began to talk  
9           about, but I think it needs rethinking.

10                   So the forester has an idea of some kind  
11           of equilibrium or management state in the landscape,  
12           the wilderness enthusiast has another and the  
13           conservationist who is trying to steer a middle course  
14           or the landscape planner might have a third idea.

15                   So you can't please all of the people all  
16           of the time absolutely, and I would suggest to you that  
17           what you are really trying to do is to perhaps half  
18           please all of the people all of the time and there will  
19           be grumbling on all sides probably if you make good  
20           decisions.

21                   Now, coming on to diversity in the  
22           landscape. Diversity is a very fundamental concept.  
23           Aesthetically we value diversity in your lives.  
24           Economically it is a necessity. You only have to look  
25           at some northern communities to know that the highs and

1        lows that they go through are due to a lack of economic  
2        diversity which, in turn, relates to a lack of resource  
3        diversity.

4                    The second point that needs to be made is  
5        diversity is a complicated concept. Ecologists have  
6        been grappling with it, fighting over it, discussing it  
7        for years and I guess economists do in so in their own  
8        way. We can get into lots of formal and statistical  
9        details, but I think this would be a mistake. If the  
10       people making decisions will say roughly what it is  
11       that they want to do, then the technicians and  
12       scientists can always come up with a formula to do the  
13       job. So it will be a red herring to get into these  
14       details.

15                   However, there are two ideas of diversity  
16       that need to be raised here and need to be understood.  
17       The idea of diversity within ecosystems. Now, this is  
18       the concept of diversity that you have been hearing  
19       from, and perfectly appropriately, from people like  
20       Dave Euler and others, how many different kinds of  
21       organisms do you have within each ecosystems and how  
22       they are distributed.

23                   This panel is really raising a second  
24       sub-concept or a second way of looking at diversity.  
25       It is really a matter of getting up in a plane or a

1       satellite or helicopter and looking at the land at a  
2       different scale. Just as you can have patches and  
3       distributions of diversity within an ecosystem, so you  
4       can have the same thing within the landscape.

5                You must be very familiar with this from  
6       all of the forestry, management, silviculture and  
7       economics that has been bandied around in recent  
8       months.

9                Now, diversity is the fundamental  
10      determinant of what goes on -- I'm sorry. Disturbance  
11      is the fundamental determinant of biodiversity in the  
12      landscape along which - and I should have mentioned  
13      this - the counter process of succession. So  
14      succession is producing gradual change and disturbance,  
15      particularly severe disturbance is setting everything  
16      back to square one or very nearly so.

17              Intermediate rates of disturbance give  
18      the highest diversity in a landscape and this is a  
19      relatively recent idea. It means that we must be a  
20      little less simplistic perhaps than we been. People  
21      tend to say diversity was produced by this or that or  
22      the other, and at least in terms of disturbance it can  
23      reduce diversity or it can increase it, and I hope in  
24      the cross-examination or in the evidence-in-chief the  
25      reason for that will become apparent.



1                   MADAM CHAIR: Excuse me, what do you mean  
2 by intermediate?

3                   DR. SUFFLING: Intermediate as opposed to  
4 very high or very low.

5                   The forest industry obviously is adding  
6 to the total amount of disturbance in the landscape.  
7 They endeavor to counter the natural disturbance to  
8 replace it with logging, but that isn't, in functional  
9 terms, entirely successful. There are many fires that  
10 get away and so we have a net increase in disturbance.

11                   Some sub-concepts that lead tacking on  
12 the end here. First of all, in contrast to much of  
13 what has been talked about, species poor ecosystems do  
14 contribute to allow diversity. They may not have many  
15 species within them, they may have a very simple  
16 structure, but very often they have quite distinctive  
17 species that are not found elsewhere, certainly that  
18 are not represented under the moose and deer banner,  
19 and so in the total landscape they add to diversity.

20                   Habitat supply analysis can't --

21                   MADAM CHAIR: Excuse me. Dr. Suffling,  
22 can you give us an example of a species poor ecosystem?

23                   DR. SUFFLING: Yes.

24                   MR. FREIDIN: Sorry, what was the  
25 question, Madam Chair?

1                   MADAM CHAIR: I want an example of a  
2 species poor ecosystem.

3                   MR. FREIDIN: Thank you.

4                   DR. SUFFLING: A good example would be  
5 one of the ones that has been raised in the forest  
6 ecosystem classification. It bears the number of V38,  
7 but basically it is a wet, acid situation with small --  
8 generally small black spruce trees somewhat scattered.  
9                   It only has really one tree species of  
10 any note. It doesn't have a complicated shrub layer,  
11 it has simple sphagnum moss on the forest floor and it  
12 doesn't have many animal or bird -- bird, mammal or  
13 other species as a consequence, but those that it does  
14 have tend to be very distinctive, like the (inaudible)  
15 cow, like the boglemming, like the insectivorous plant,  
16 the pitcher plant, which is the provincial emblem in  
17 Newfoundland if you have ever seen it.

18                   So these are quite distinctive species  
19 that are not found in a lot of other ecosystems. If we  
20 work, for instance, to loss that particular vegetation  
21 type, then we will probably lose most or all of those  
22 species.

23                   MR. LINDGREN: Madam Chair, I should just  
24 indicate that that example is found on page 53 of the  
25 witness statement.

1                   MADAM CHAIR: Thank you.

2                   DR. SUFFLING: A little later on I will  
3 get an overhead out to illustrate that point in a  
4 little more detail.

5                   As a result of this, we need ecosystems  
6 supply analysis essentially to replace the concept of  
7 habitat supply analysis as represented by looking after  
8 deer, looking after moose or maybe adding a couple of  
9 other species like marten or the pileated woodpecker.

10                  We need to describe the landscapes that  
11 we have consistently. There are tools, technical tools  
12 that exist to do this, to gather the information, to  
13 process into maps and then to begin to make decisions  
14 about the species on the maps that represent real  
15 ecosystem.

16                  The tools that we have are not quite  
17 complete; they need modification and improvement, and I  
18 talked about that in the witness statement. We need to  
19 predict how landscapes will change. There are basic  
20 models for doing this. They are pretty standard stuff  
21 in terms of modelling and systems design, and there is  
22 basically -- there is nothing fundamental to doing  
23 that. All the pieces are there, standard things that  
24 can be put together into a working machine in a sort  
25 time, relatively short time.

1           We need to choose desired states and we  
2       can specify concrete goals or guidelines that can be  
3       applied. Those can be based on technical criteria such  
4       as will be talked about this morning, but also of  
5       course on the basis of public opinion and politics, and  
6       then we can monitor what is happening.

7           Now, by monitoring, as Dr. Bendell  
8       pointed out, we don't mean going out and counting every  
9       bug in the forest. It is a matter of using the effort  
10      that is available wisely to maximum effect.

11          Then lastly, and this is very important,  
12      as we go, of course we are going to make mistakes or we  
13      are going to find better ways of doing things,  
14      technology will change, economic conditions will  
15      change, recreational pressures will change and so on.  
16      So we need to adjust timber management accordingly and  
17      that has been talked about at great length at the  
18      beginning of the hearings, as you know.

19          So that's the basis of what I have put in  
20      my written statement.

21          MR. LINDGREN: Thank you. Perhaps this  
22      is an appropriate time for the morning break, Madam  
23      Chair.

24          MADAM CHAIR: Good idea, Mr. Lindgren.  
25      We will be back in 20 minutes.

1 MR. LINDGREN: Thank you.

2 ---Recess at 10:25 a.m.

3 ---On resuming at 10:45 a.m.

4 MADAM CHAIR: Please be seated.

5 MR. LINDGREN: Madam Chair, I would like  
6 to begin by filing hard copies of the overheads to be  
7 used by Dr. Suffling and the package consists of some  
8 17 pages.

9 MADAM CHAIR: That will be Exhibit 1729.

10 MR. LINDGREN: Thank you.

11

12 ---EXHIBIT NO. 1729: Hard copies of the overheads to  
13 be used by Dr. Suffling  
consisting of 17 pages.

14 MR. LINDGREN: There is an additional  
15 document to file as well and it is a two-page excerpt  
16 from an article by Dr. Suffling entitled Stability and  
17 Diversity in Boreal and Mixed Temperate Forests: A  
18 Demographic Approach, and it appears in Volume 17 of  
19 the Journal of Environmental Management, pages 359 to  
20 371. As I have indicated, it is a two-page extract.

21 MADAM CHAIR: All right. This is a  
22 two-page article by Dr. Suffling.

23 Did everyone get the reference for that  
24 or do you want it repeated?

25 MS. BLASTORAH: Could you repeat it,



1 please, unless it is on here. It is on the document.

2 MADAM CHAIR: This will Exhibit 1730.

3 ---EXHIBIT NO. 1730: Two-page excerpt from an article  
4 by Dr. Suffling entitled  
5 Stability and Diversity in Boreal  
and Mixed Temperate Forests: A  
Demographic Approach.

6 MADAM CHAIR: Anything else, Mr.

7 Lindgren?

8 MR. LINDGREN: Pardon me?

9 MADAM CHAIR: Anything else?

10 MR. LINDGREN: Not at this time.

11 MADAM CHAIR: You are in a real filing  
12 mood.

13 MR. LINDGREN: Q. Dr. Suffling, I would  
14 like to begin by asking you about the title to your  
15 section of evidence. It is entitled Ecosystem Supply  
16 Analysis. What do you mean by that phrase and how it  
17 it different from habitat supply analysis?

18 DR. SUFFLING: A. What I mean by  
19 ecosystem supply analysis is that all the ecosystem  
20 types that are currently represented in the landscape  
21 or perhaps historically represented in the landscape  
22 should be made provision for in the planning and in the  
23 management, that the management should revolve around  
24 that concept rather than around providing habitat  
25 elements that are suitable for one or a few species

1 such as, for instance, retaining some hemlock trees as  
2 cover for deer or making sure that there is some shrubs  
3 for moose to browse. That is the essence of habitat  
4 supply analysis which looks to individual species.

5 Inevitably, and as has been pointed out  
6 by Dr. Bendell, it cannot provide for all the species  
7 or all the needs of the users in the landscape.

8 Q. Now, just before the break you  
9 mentioned an example involving the FEC V38 type, which  
10 is the black spruce type, and you have indicated that  
11 HSA won't help with respect to the species, the unique  
12 species that are found or associated with that stand  
13 type, and why is that?

14 A. Well, essentially you have an  
15 ecosystem there that is not really very conducive to  
16 moose and wouldn't be used by a pileated woodpecker.  
17 It would have some marginal value perhaps for marten  
18 and certainly wouldn't be used by white-tailed deer  
19 unless they were just travelling through.

20 Q. In your opinion, Dr. Suffling, should  
21 Ontario move beyond featured species management for  
22 moose and deer and begin planning and managing for  
23 diversity?

24 A. Certainly, I think it should. That's  
25 not to argue against looking at featured species in

1 certain areas and managing for them intensively or less  
2 intensively, but it does mean that we have to move away  
3 from the concept which is driven by societal  
4 imperatives from the past rather than looking to the  
5 future and to changing...

6 Q. In your opinion, what are the main  
7 advantages associated with managing for diversity as  
8 opposed to featured species management?

9 A. What you are really trying to do in  
10 managing for diversity in a landscape is not only to  
11 make provision for all of the organisms that are there,  
12 and that's important intrinsically and scientifically  
13 and certain people value that, but it also means that  
14 you are going to make provision for all of the  
15 different kinds of organisms that are used by people as  
16 well.

17 So it is not just an aesthetic or a  
18 biological concept. I think it has a lot of practical  
19 merit. It means that you are going to provide enough  
20 organisms, enough furbearers for trappers. It means  
21 that you are going to provide something for the  
22 recreationist and of course it is going to provide  
23 timber for the forest industry.

24 Q. On that point and in your opinion  
25 would managing for diversity be amenable to the concept

1 of multiple use in our forests?

2 A. I think the answer to that depends on  
3 what you mean by multiple use and you have to be very  
4 careful in talking about multiple use because it means  
5 all sorts of different things to all kinds of people.

6 To some people, multiple use means  
7 everything goes on in the same area at the same time,  
8 let it rip, you know, that's really not very logical or  
9 very workable.

10 It can also mean taking a given section  
11 of land, dividing it up spacially and then assigning  
12 difference uses or combination of uses to different  
13 parts of the land. So that one area might be  
14 intensively managed for recreation and in another area  
15 the forestry imperative dominates and in a third  
16 perhaps nature conservation.

17 Having said that, some of the other uses  
18 will be subsidiary in the other areas, so they don't  
19 cease to go on.

20 Another concept of multiple use is a  
21 sequence of events through time. It may be totally  
22 unworkable and indeed unsafe to have hunting and  
23 intensive recreation going on in the same area at the  
24 same time, but in an area that is intensively used for  
25 recreation in the summer could quite conceivably be an



1 area where hunting goes on in the winter. So you can  
2 get sequences by season or perhaps in the longer term  
3 during the successional stages of development of a  
4 forest.

5 So that what happens early on with maybe  
6 berrypickers when the blueberries are there and then  
7 moose coming in a little later and then trappers being  
8 able to work better later on still is a sequences of  
9 uses that will follow the succession in the forest.

10 Now, given that in the landscape you are  
11 trying to encourage or foster a variety of different  
12 ecosystem types, then it follows that you are going to  
13 get provision for each of these uses because at any one  
14 time there will be berry patches, there will be shrub  
15 lands, there will be mature forest. So to put it  
16 crudely, everything gets a kick at the cat.

17 Now, that doesn't mean to say that there  
18 can be berry patches everywhere or that there can be  
19 mature forest everywhere, there is a balance to be  
20 struck and that balance will be determined by  
21 scientific and technical information and it will be  
22 decided by people, hopefully, through public input and  
23 through the political process.

24 Q. Now, you have indicated that in your  
25 opinion we should be managing for diversity. Can we do



1 that through the landscape planning and management  
2 approach described by Dr. Middleton?

3 A. Yes. Now, Dr. Middleton has  
4 described the landscape mosaic.

5 Q. Is that mosaic static and if it is  
6 not, what are the factors that contribute to the  
7 dynamic nature of the landscape mosaic?

8 A. Okay. First of all, let's define  
9 what we mean by static and dynamic. Something is  
10 static if there is no turmoil, if there is no change  
11 within it. So when we look at a rock, that's static.

12 If we look at a standing wave in a  
13 stream, it doesn't appear to change position or even to  
14 change shape very much, but it is dynamic in the sense  
15 that the water is being replaced and removed all the  
16 time in that spot in the stream.

17 So the mosaic is certainly not static.  
18 It may be -- some mosaics may be at equilibrium,  
19 meaning that they are not changing very much over time,  
20 but nevertheless there is this turmoil going on all the  
21 time like the pea soup analogy that I used earlier.

22 Q. Now, can human disturbance such as  
23 logging or fire suppression exaggerate or disrupt  
24 natural disturbance in terms of the abundance and  
25 distribution of landscape types?

1                   A. Yes, I think it can. In fact, I'm  
2                   sure it can. Let's look at an overhead here. This is  
3                   from one of the pages that's just been distributed.

4                   MR. LINDGREN: Madam Chair, this is the  
5                   second page of Exhibit 1730.

6                   DR. SUFFLING: Now, what you are seeing  
7                   here are stand age distributions for a number of forest  
8                   management areas. These are very large areas in many  
9                   cases. They can be tens or even hundreds of thousands  
10                  of hectares. Some of them are smaller.

11                  This is one page from three pages of data  
12                  distributed all over northern Ontario and what you are  
13                  seeing here -- I know you saw these earlier on in the  
14                  hearing, but I will just reiterate what the diagrams  
15                  are about.

16                  You have the ages of the forest along the  
17                  "x" axis and then along this side you have the area of  
18                  each age, and you will notice that for statistical  
19                  purposes these areas are put on a log scale so that  
20                  each unit up here goes up by an order of ten. So we  
21                  have ten -- sorry, .1, 1, 10 and 100 per cent of the  
22                  area. So you have to be careful at interpreting the  
23                  shapes that you are seeing.

24                  Now, if an area like this was in an  
25                  equilibrium you would see a shape like this.

1 (indicating) You would have a lot of young forest and  
2 not very much old forest, and the reason for that would  
3 be that over time each of these bars here is advancing  
4 to the right, becoming older and as it does so it is  
5 being abraded, if you like, chopped apart by forest  
6 fires in this case or by logging or other disturbance  
7 activities.

8 What is happening is that the material  
9 that is removed between, say, this point and this point  
10 here is being recycled. The area is reappearing as  
11 young forest. So in a sense it is like watching kids  
12 sliding down a slide and then going back to the  
13 beginning and climbing up to the top again. If the  
14 landscape was in a complete equilibrium you might see a  
15 curve of this kind.

16 Now, you notice that that is so for the  
17 older part of these curves. There was some kind of  
18 equilibrium that was found decades ago. In recent  
19 decades, the amount of disturbance has been falling and  
20 so you get this hump-shaped curve.

21 Now, the reasons why disturbance has  
22 fallen are, in recent decades because of fire control,  
23 but because this goes back much longer than fire  
24 control has been effective, previously it was due to a  
25 natural change in climate. So we can expect to see

1       that natural curve depressed even more in recent  
2       decades, and there it is, it is becoming steeper in  
3       many of these cases, and that is because we are pushing  
4       the curve down with fire control.

5               Now, equally, if we go into a management  
6       unit like Red Lake, and these data come from before  
7       there was a lot of logging in that area, then you would  
8       expect to see this curve changing shape again with more  
9       young forest being produced by logging activities.  
10      That says nothing about the quality of those forests,  
11      only the quantity that they are growing up.

12             Q. Now, you have indicated in your  
13      witness statement that when we superimpose human  
14      disturbance on the natural disturbance regime the  
15      result in fluctuation may result in the loss of  
16      ecosystem system types together with their unique  
17      organisms.

18             How would that occur and do you have any  
19      examples of that process?

20             A. Yes. One example that comes to mind  
21      very easily is that of old growth white pine in the  
22      eastern areas of the province where, because of some  
23      very unwise logging practices around the turn of the  
24      century, it has virtually disappeared as a type.

25             The second example would be -- actually



1 if we put this overhead back up again and look at some  
2 of these areas in northwestern Ontario, the closest one  
3 we have got here is probably Red Lake. There is a  
4 neighbouring place to this called Lac Seul which was a  
5 fur trading depot and there are very detailed records  
6 for Lac Seul.

7 Now, we know that this peak here  
8 represents here represents a lot of fire that happened  
9 in the middle to later years of the 19th Century, and  
10 in the earlier part of that time there were elk  
11 actually found in that area which doesn't show up in  
12 the textbooks and it not widely known, but they do come  
13 up in the trading records, and they are there because  
14 of an enormous amount of fire.

15 So you had during that period a landscape  
16 which, according to the documents, from the Winnipeg  
17 River all the way through to (inaudible) House, which  
18 is maybe a space of perhaps 400 kilometres, was nothing  
19 but one burn waste according to the people of those  
20 times. The moose and the caribou declined  
21 percipitously and elk appeared.

22 Since then, the amount of fire has  
23 diminish quite considerably. The forests have grown  
24 back up and the elk have disappeared completely and the  
25 moose and the deer -- the moose and the caribou have



1       made something of a come-back, mainly moose.

2                   Q.   Okay, thank you.  Can you explain how  
3       logging, particularly large area clearcutting, might,  
4       combined with factors such as climate change and fire  
5       suppression, affects the composition and age class of  
6       the forest?

7                   A.   Generally, we can expect that logging  
8       will remove some of the mature forest and will replace  
9       it with immature forest and we can expect fire to do  
10      the same thing.

11                   This is some data that we have --  
12      national data from Sweden.  Now, you can ask:  Well,  
13      why are we looking at Swedish data.  The reason is that  
14      we need in conjunction with this to do a lot of work  
15      with weather records and the federal government has  
16      shut down a good many of the weather stations in  
17      northern Ontario making the records -- remaining  
18      records less easy to use.  So we go to Europe where  
19      they have been more punctillious in the past.

20                   MR. LINDGREN:  Madam Chair, we are  
21      looking at page 4 of the hard copies of the overheads,  
22      Exhibit 1729.

23                   DR. SUFFLING:  So what you have here is a  
24      computer model, a simulation and it shows the same  
25      thing that we were looking at with those multiple

1 diagrams. The forest age is running across here from  
2 the young forest to the old forest and then the  
3 percentage of the area along here and you will notice  
4 that in this case that is on a normal linear scale.

5 Now, there are four levels of burning  
6 specified in the model here, different percentage areas  
7 burned with the smallest at the top, the greatest at  
8 the bottom. I'm sorry, this hasn't reproduced very  
9 well, but basically if we run the model forward to  
10 2070, about 80 years from now, you would find there is  
11 in fact very little mature forest. That's because most  
12 of it has been logged.

13 If you combine this with a high rate of  
14 fire, then you would find that there is almost no  
15 mature forest at all. So we see this in the right-hand  
16 bars on each -- on each main bar here. The right-hand  
17 option is the high fire option, that one there, and  
18 that one there and this one here. (indicating)

19 You are finding with a combination of  
20 logging and fire there is virtually no really mature  
21 forest left. If you increase the amount of logging,  
22 you would get an even greater discrepancy between the  
23 different fire areas.

24 MR. LINDGREN: Q. In your opinion, can  
25 global warming increase fire in the boreal forest?

1 DR. SUFFLING: A. Yes, I believe it can.

2 Q. And what are the implications of that  
3 possibility for forest managers?

4 A. I have an overhead here which I was  
5 going to bring up later. I will have to find it.

6 Using the Swedish example again --

7 MR. LINDGREN: This is page 3 of the  
8 hand-out, Madam Chair.

9 DR. SUFFLING: This is an example of the  
10 effect of rising temperature on the amount of fire  
11 experienced.

12 Now, these are historical data, this is  
13 not a model. And what we did was we looked at the area  
14 of fire that occurred each year and we compared it with  
15 the summer temperatures during the fire season and we  
16 had an excellent data set from the Climate Research  
17 Centre in east Anglia, which is why we used this  
18 example.

19 These temperature deviations, from minus  
20 two to plus two, represent deviations from the average  
21 summer temperature so that zero is the average, these  
22 are warm years and these are cold years, and the spots  
23 here are the actual years, the data set. Then using  
24 that information we can plot the total area of fire as  
25 judged from government statistics against these

1 temperature deviations. So we get this scatter.

2 Finally, we can take a statistical  
3 program and we can fit -- a line of best fit to those  
4 data so that we are able to predict on the average what  
5 would happen given a warm year or a cold year. What  
6 you see is when the temperatures are low the amount of  
7 fire does not fall very much. It falls very slight.

8 There is some kind of break point here  
9 around the historical average, that's just  
10 coincidental, where the amount of fire begins to  
11 increase dramatically and, in fact, for something like  
12 a two degree rise in temperature you would expect to  
13 get a fivefold increase in forest fire nationally in  
14 Sweden.

15 One of the reviewers for the papers  
16 questioned whether this data point here is affecting  
17 the curve, and it will probably be raised later in  
18 cross-examination. I can tell you that it doesn't.  
19 When you take that point out, the curve moves a little  
20 bit but not very much. I don't know whether it is  
21 statistically different, but it is a very close curve  
22 to the original one.

23 So with the observed range in temperature  
24 we can get a fiveold increase in fire with a two degree  
25 variation in temperature. Expected temperature rises

1 in the summertime in areas like the boreal part of  
2 Sweden or particularly in northern Ontario where the  
3 effect will be more pronounced in the region of three  
4 to five degrees Centigrade.

5 Now, we just don't have any data that go  
6 three to five degrees up that way, so whatever we do is  
7 guessing. If you extrapolate this line, which is very  
8 dangerous to do scientifically, incidentally, but if you  
9 dare to do it and you just calculate where would the  
10 curve be within a three or five degree temperature  
11 rise, you start to get increases in fire of 30- to  
12 50-fold.

13 Now, those would not be realized in  
14 practice for a number of reasons. There would be a  
15 very rigorous fire fighting response to that, but there  
16 would also be a limit that would be imposed by the  
17 amount of forest that remained to be burned.

18 But given those sorts of worries and even  
19 given the exactitude of the data, you could see that  
20 global warming is likely to reduce massive increases in  
21 fire. That has all sorts of implications for the  
22 availability of timber and for landscape management.

23 Q. How does a landscape manager take  
24 that factor into account?

25 A. Well, I think we have to be very



1 careful in assuming that large clearcuts will replace  
2 large burns. Again, I will go to some data that I was  
3 going to pull out probably later. I will bring these  
4 up now. I'm not sure which page this is from the  
5 exhibit.

6 What I have done here is to plot out the  
7 size of different fires.

8 MR. LINDGREN: This is page 15 of the  
9 hand-out, Madam Chair.

10 DR. SUFFLING: These data are taken from  
11 the Ontario Ministry of Natural Resources Statistical  
12 Digest which is published every year.

13 On the "x" axis here we have the sizes of  
14 fires going from small fires here to large fires at  
15 this end. The sizes of the classes are determined by  
16 the way in which the data are divided up by the  
17 government, and they seem to be rather odd units but  
18 that relates back to when it was not done in metric but  
19 was done in English units and they made a more or less  
20 direct transfer from one system to the other.

21 On this side of the graph you have the  
22 total area that is accounted for by fires of a given  
23 size. You can see that even though you have an  
24 enormous number of small fires, they occupy so small an  
25 area that they don't even show and they hardly show on

1 the graph. When you get to the really big fires, of  
2 which there are very few incidentally, these are the  
3 ones that account for the vast majority of the burned  
4 area and that is true of bad fire years and it is also  
5 true of moderate fires years, although to a lesser  
6 extent.

7 1983 was a bad fire year and it's worth  
8 pointing out that, if you will excuse the expression,  
9 since 1975 or 1976 all hell has broken loose in Ontario  
10 and in other provinces in terms of forest fire area.  
11 It may be, we are not certain, it may be something to  
12 do with climate warming. I wouldn't want to bet on  
13 that, but it's a reasonable hunch.

14 Okay. So here is a bad fire year and  
15 almost all of the fires are accounted for by -- almost  
16 all of the total area is accounted for by the large  
17 fires.

18 Now, we will compare 1983 with 1987. You  
19 can do this for almost any two years with very  
20 different total fire areas. This is a moderate fire  
21 year with about -- I think about 70,000 hectares burned  
22 in all in the province. So the effect of the large  
23 fires is less pronounced, but still, you know, very  
24 much there. You have to watch this "y" scale here  
25 because our total here is 80,000, not nearly 500,000.

1 You are still getting over the fires in the big  
2 classes. That's by area, of course.

3 Now, if we start to compare the two  
4 years, what we would expect to see is that if you took  
5 any particular size class of fires and you took the '87  
6 fires, which is the moderate year, you divided '83 by  
7 '87 you would get a ratio of one to the other. You  
8 would expect it to be more than one because in bad  
9 years the fire is going to get a bit bigger in spite of  
10 the fire control.

11 If fire control was equally effective for  
12 all the different sizes, you would expect this ratio to  
13 stay much the same across the graph.

14 MR. FREIDIN: I'm sorry, in what  
15 circumstance would you expect that? I didn't catch  
16 that.

17 DR. SUFFLING: If fire control was  
18 equally effective in lessening the fire area you would  
19 get a ratio which would be more than one, but you would  
20 expect it to be the same for all size classes of fires.

21 Let's give a concrete example. Let's say  
22 you had 500 hectares in one year of two to four  
23 hectares in size, in another year you had a thousand  
24 hectares, so you would get a ratio of two to one. If  
25 you moved up one size class and firefighters were just

1 as good at putting out those fires, you would expect to  
2 get the same ratio, two to one, and that's what you  
3 find all the way across here with these different size  
4 classes, all the way up to fires of between 40 and 200  
5 hectares and that's critical.

6 When you move into the next size class,  
7 there is this dramatic increase. One is tempted to  
8 say: Wham, it is just an enormous increase in the  
9 ratio and it goes up to more than six to one. What  
10 this means to me is that the very big fires are not  
11 being controlled effectively or not as effectively.

12 When you talk to people in the north or  
13 when you see fires being fought in the north you know  
14 what happens. Little fires break out one or two or  
15 three here and there and they are generally put out  
16 early in the morning, they don't get a chance to get  
17 going. Then you get a run of dry weather, windy  
18 weather, maybe some lightening without rain, all of a  
19 sudden one morning there are 5 or 10 or 30 fires  
20 burning.

21 They increase rapidly in size. All the  
22 resources are available and committed to them and  
23 initially there is a reasonable amount of fire control,  
24 but there comes a point, as in a war time situation,  
25 where the defences are just overwhelmed, and at that



1 point the fires begin to grow at their own rate until  
2 the weather moderates.

3 Now, the point of all this -- this is a  
4 rather long digression. The point of it is that the  
5 effect on large clearcuts is to add that area of  
6 disturbance to the total. Not to replace the fires,  
7 but to have fires plus large clearcuts. So the total  
8 amount of disturbance in the landscape is very, very  
9 much greater than it would have been and that is one  
10 strong argument for keeping the size of clearcuts to  
11 somewhere between 40 and 200 hectares, as demonstrated  
12 in the graph.

13 MR. LINDGREN: Thank you.

14 MADAM CHAIR: Excuse me, Dr. Suffling.

15 Can you go over your reasoning again with  
16 respect to -- are you saying that with smaller harvest  
17 areas, whether you want to call them clearcuts or  
18 modified areas, would they in fact replace fires as  
19 opposed to adding to the total --

20 DR. SUFFLING: They would replace them in  
21 an areal sense, in the sense of the area that is  
22 occupied. Areas that might formally have been expected  
23 to burn would now tend to be cut and there would be a  
24 balancing in that sense.

25 Now, I hesitate -- I must add that the



1 effects of logging and burning are not going to be  
2 equivalent in those areas, but there is functionally a  
3 replacement of one with the other.

4 When it comes to the very large clearcuts  
5 and the large burns, the effect is additive rather than  
6 a replacement.

7 MADAM CHAIR: Let me understand this  
8 replacement concept. Are you saying because small  
9 fires can be controlled that the fire suppression gives  
10 us more room to use that area for logging because it  
11 would have been burned in those smaller patches anyway?

12 Is that the replacement effect as opposed  
13 to the additive?

14 DR. SUFFLING: Yes. The effects of  
15 logging on those areas are, as has been demonstrated by  
16 various people, including Tom Hutchinson, the effects  
17 of logging on those areas is different from the effect  
18 of fire. Ecologically different.

19 MR. MARTEL: It seems difficult to  
20 accept, though, that because you have clearcuts of 100  
21 hectares to 200 hectares and because fires are  
22 traditionally, roughly in that area except for the  
23 larger ones, that it simply follows that if you reduce  
24 the size of the clearcuts you are going to also reduce  
25 the size of the large areas that are being clearcut or

1 destroyed by fire.

2 How do the two come together? I mean,  
3 what relationship is there between the fire that's  
4 caused and it burns 200 hectares and the clearcuts, if  
5 you keep them small, that somehow they will lead to the  
6 conclusion that you come to?

7 DR. SUFFLING: Okay. I think I  
8 understand what you are saying, Mr. Martel.

9 MR. MARTEL: I can't make that step.

10 DR. SUFFLING: When it comes to small  
11 fires, you have a -- fundamentally you have a choice.  
12 You can fight them or you can leave them.

13 MR. MARTEL: All right.

14 DR. SUFFLING: When it comes to large  
15 fires, I am saying that our technology on those few  
16 days when large fires really rip through the forest is  
17 insufficient to control them effectively.

18 MR. MARTEL: I understand that.

19 DR. SUFFLING: We also have a choice with  
20 the logging of the amount and the size of the cuts that  
21 we make. So functionally we could make small clearcuts  
22 in some sense, not entirely but in some sense, act as a  
23 surrogate to some of the burning, but when it comes to  
24 the large clearcut and the large burn there will be  
25 presumably an economic imperative to maintain the total

1 area which is cut or which was been planned for cutting  
2 and at the same time natural will decide how much is  
3 burned, whether you want it or not, unless we invent  
4 something very --

5 MR. MARTEL: I guess it is the surrogate.  
6 How do you make it be the surrogate if fire happens  
7 willy nilly, depending on conditions?

8 DR. SUFFLING: Yes. It will choose the  
9 time and the place unless it is a prescribed burn.

10 MR. MARTEL: Right.

11 DR. SUFFLING: That will usually come  
12 after logging.

13 MR. MARTEL: In the boreal forest, after  
14 logging, fire?

15 DR. SUFFLING: As a site preparation  
16 method.

17 MR. MARTEL: Oh, as a site preparation  
18 method, but what about -- I am just having difficulty  
19 with the concept that it becomes the surrogate, that it  
20 will affect how -- clearcutting will affect how things  
21 had burn or vice versa.

22 DR. SUFFLING: I'm not saying there is a  
23 functional relationship between the two.

24 MR. MARTEL: Okay. How do you come to  
25 that conclusion then?

1 DR. SUFFLING: All I am saying is that if  
2 you have large clearcuts, you cannot expect to say  
3 that: Well, we have controlled fire and these  
4 clearcuts are replacing the fire because effectively we  
5 cannot control such fires very well.

6 MR. MARTEL: Right.

7 DR. SUFFLING: That's all I'm saying.

8 MR. MARTEL: Okay.

9 MR. LINDGREN: Q. Dr. Suffling, perhaps  
10 I can ask some questions and we can clarify this  
11 situation.

12 First of all, can I ask you point blank,  
13 do you accept the proposition that large area  
14 clearcutting duplicates fire in the landscape?

15 DR. SUFFLING: A. No. I think it adds  
16 to the amount of fire that's there and qualitatively on  
17 individual areas it is different.

18 Q. What are the principal differences  
19 between large area clearcutting and fire?

20 A. There will be differences in the  
21 structure of the ecosystems that results. Most fires  
22 will leave snags, down timber, so that that forms a  
23 structural component in the subsequent stand that grows  
24 up.

25 The kind of structure that's left behind

1 by logging and sometimes lack of structure is different  
2 because in the first place there won't be those snags  
3 left; in the second place, the timber that is left on  
4 the ground will tend to be pushed into windrows instead  
5 of distributed. So that's the structural change.

6 Then there are changes in nutrients  
7 because the logging has the effect of removing all  
8 nutrients that are locked up in large pieces of wood.  
9 Fire will tend to redistribute the nutrients in the --  
10 particularly in the fine fuels and it will distribute  
11 those nutrients rather differently because of the heat  
12 that's involved. They tend to get rid of sulphur and  
13 nitrogen and so on and leave some of the others behind.

14 So there are structural differences,  
15 there are -- we are talking about clearcutting and  
16 burns here rather than shelterwood or something of that  
17 sort.

18 Then are the nutrients effects and then  
19 finally there are effects on species and perhaps the  
20 best documented and most dramatic at all is with jack  
21 pine which can regenerate very well after logging but  
22 doesn't always do so, and after fire it is really  
23 closely adapted to that situation and it comes through  
24 very well afterwards generally.

25 Q. And my final clarification question



1 is: Would smaller cuts in the landscape create the  
2 small patches associated with most fires as opposed to  
3 adding large clearcuts to the impact of large fires?

4 A. I'm sorry, you will have to clarify  
5 that point. I can't follow what you are asking.

6 Q. I am just asking --

7 MR. FREIDIN: I am just wondering, Madam  
8 Chair, can the answer to the question -- I mean, he is  
9 leading the witness on a very important element here  
10 and I would rather have him try to ask the question  
11 without leading the witness in this issue.

12 MR. LINDGREN: I am not sure at all it is  
13 a leading question, Madam Chair, and it in no suggests  
14 the answer.

15 I am asking Dr. Suffling for his opinion  
16 as to whether or not having smaller cuts in the  
17 landscape, smaller cuts that duplicate or simulate the  
18 size of the patch that we see under the fire regime, is  
19 that different than the impact of adding large  
20 clearcuts to the landscape, clearcuts which you have  
21 said are additive to the effect of large area burning.

22 MADAM CHAIR: I don't know if that  
23 question is leading, Mr. Lindgren, but I don't  
24 understand it.

25 MR. LINDGREN: Well, that's a different

1       problem.

2                       MADAM CHAIR:   And that's a problem.

3                       MR. LINDGREN:   Okay.

4                       Q.   As a forest manager, if you are  
5       interested in replicating or simulating the impacts of  
6       fire on the mosaic, would you tend towards smaller  
7       patches or would you be tending towards the large area  
8       patches that we have seen in the form of large area  
9       clearcutting?

10                      DR. SUFFLING:   A.   I would tend to  
11       advocate cutting in small patches or relatively small  
12       patches.

13                      The reasons for this, as I have stated,  
14       are essentially that nature is going to do a job on the  
15       big patches any way regardless of economics or plans or  
16       intentions.   So those big patches will already be  
17       present and will continue to be present in the  
18       landscape regardless of our best laid plans.

19                      Q.   If we were interested in mimicking  
20       the impacts of fire, would that lead you towards  
21       smaller cuts or large area cuts?

22                      A.   Because of what I have just  
23       explained, it would lead to me to advocate relatively  
24       small cuts in the vast majority of cases.

25                      Q.   Okay, thank you.   Now, I have just

1 used the term and patches and the terms patches is  
2 found on page 49 of your witness statement.

3 Can you briefly explain what you mean by  
4 that term?

5 A. If we look at a fairly typical forest  
6 resource inventory map here, individuals stands are  
7 represented, as you probably know, by these linear  
8 boundaries.

9 So that this -- I'm sorry, I am finding  
10 it very difficult to draw on these overheads. The  
11 system is the other way up from the one I usually use.

12 Let's take this one here if I can get my  
13 pen onto it. There is one stand and adjacent to that  
14 is another stand here which is of the same age, but  
15 somewhat different composition. I don't know whether I  
16 can get the whole area. I believe it is that shape.

17 Now, in terms of a patch, I might be  
18 wrong here in the technicalities because of the  
19 complexity of the map, but basically these two  
20 together, assuming that they were a single forest fire  
21 or blowdown or something, would form a patch in the  
22 landscape or it might be five or ten of these or just  
23 the patch the same as the stand, but it is basically a  
24 piece of the landscape that's been disturbed by  
25 logging, by fire, by windthrow or some other activity.

1                   Q. Can I ask you whether or not in  
2                   general, does the size and shape and distribution of  
3                   patches, particularly cut patches, does that have any  
4                   effect on a wildlife species' ability to locate and use  
5                   adequate habitat?

6                   A. I think to answer that accurately you  
7                   would have to know the species concerned. Some  
8                   species, particularly larger mobile ones like bear and  
9                   moose and so on, even snow shoed hair, would tend to  
10                  move between patches for different purposes. They  
11                  would use some kinds of stands for shelter, some for  
12                  reproduction for nesting in the case of birds, some for  
13                  feeding and some just for loafing around.

14                  In those cases there would be several  
15                  different kinds of patches. So obvioulsy the  
16                  separation of one patch with some other patches of the  
17                  same kind - I don't know whether this is the same kind  
18                  but let's assume it is - separation, distance here is  
19                  going to be important, as well as as what is in  
20                  between, whether the animal can physcially move through  
21                  the area or whether it cares to.

22                  Then within the patches the shape affects  
23                  the ecotone, the boundary with the next area and what  
24                  is in the next area affects the nature of that  
25                  boundary.

1                   Now, within the patch or within the  
2 stand, the distance from the interior to the edge, as  
3 Dr. Middleton pointed out, is going to be very critical  
4 to certain species that like to live in the interior of  
5 patches rather than on the edges.

6                   Q. Just yesterday Mr. Martel asked a  
7 question having to do with clearcut size, I believe,  
8 and he asked whether or not there was a relationship  
9 between the size of the cut and the ability of species  
10 to move or to find adequate habitat and I think he put  
11 forward the proposition, is there a relationship in the  
12 sense that the larger the cut the more difficult it  
13 might be for certain species.

14                  Do you have any views on that?

15                  A. Yes. If we look, first of all, at  
16 plant species, we would find that those that have to  
17 live in the centre of the large clearcut may survive if  
18 their climate like a lot of sun, wind and drying  
19 effects of the summer and they don't mind late frost  
20 and putting up with that physically tough environment.

21                  So certain forest interior species that  
22 are left behind after a clearcut, the pyrola for  
23 instance, don't take too well to that. Another one  
24 would be a little orchid called Goodyera or rattlesnake  
25 plantain. You wouldn't find that out in the middle of



1 a clearcut.

2 Now moving on to the animal species.

3 Certain of them are very -- fairly insensitive to the  
4 size of the clearcut, but even something like moose --  
5 I understand that there are technical papers that show  
6 that moose prefer not to go into the middle of very,  
7 very large clearcuts and that's primarily because in  
8 the winter, for instance, they will need shelter and it  
9 is a long distance sometimes to travel to the centre of  
10 the cut and then back to shelter and that exposes them  
11 potentially to predation. So there is another kind of  
12 effect with a very large, mobile animal.

13 So you have a continuum there from the  
14 very static individual like a plant all the way through  
15 to a large mobile mammal which can still have certain  
16 preferences.

17 Having said that, there are some kinds of  
18 organisms that would just thrive in the middle of a big  
19 clearcut.

20 Q. Okay. From an ecological  
21 perspective, should patches and landscape units within  
22 the forest be managed in a manner that maintains  
23 biological diversity?

24 A. Should patches and...?

25 Q. Landscape units.

1 A. Yes.

2 Q. When I use the phrase biological  
3 diversity, what do you understand that to mean?

4 A. Diversity is a complicated subject.  
5 Biological diversity has tended to be a little like  
6 this idea of multiple use. Everybody has their own  
7 idea of what it means or how it should be used. So  
8 whatever I will say here is my particular outlook on  
9 that subject. At the same time I am going to try to  
10 stick to what is generally accepted.

11 Let's just put this up again, the forest  
12 resource inventory map. Most of the people who have  
13 talked about by diversity and probably the person we go  
14 to with first the nicest explanation was Dave Euler.  
15 When he was talking about diversity he will be talking  
16 the diversity within a patch like this.

17 So how many organisms do you get in  
18 there, how are they distributed in space within the  
19 patch, what kind of layering is there within and what  
20 is the evenness with which those organisms are  
21 distributed. Here is the example that came up earlier.

22 MR. LINDGREN: This is page 7 of the  
23 hand-out, Madam Chair.

24 DR. SUFFLING: The black spruce  
25 leatherleaf sphagnum forest, V38, that was referred to

1 and I am using this incidentally because it is the same  
2 thing that David Euler used and, therefore, it gives  
3 some kind of continuity with testimony from a few  
4 months ago.

5                   You have here in this FEC diagram a  
6 rather simple vertical structure and the number of  
7 species represented in there is relatively small, and  
8 so we would say that isn't a very diverse forest type  
9 within the patches. So this is a diversity within the  
10 ecosystem.

11                   Here by contrast is V2 which is a forest  
12 type that's found on deep, fertile soils often where  
13 there used to be lakes or along stream sides and so on.  
14 It has considerable variation in structure from the  
15 herb layer through to shrubs, through to tall trees of  
16 several species, and so there are a lot of different  
17 niches, a lot of different place where organisms can  
18 hang out, from the mosses on the forest floor through  
19 to flowering plants, through to squirrels up in the  
20 trees and so on; a lot of the structure there, a lot  
21 more species than in the other case.

22                   The other factor which is more difficult  
23 to explain is that they are more evenly distributed;  
24 that is, if I can use a hypothetical example. If you  
25 had two species in an ecosystem and you had 99 in one

1 and 1 of the other. That would not be very diverse.  
2 That would not be very equitable, as ecologists say or  
3 equal. If, on the other hand, you had 50 of one and 50  
4 of the other, then that would be equitable, there would  
5 be an even spread between species.

6 So comparing these two ecosystems, the  
7 general tendency would be for this one not only to  
8 have - that is the black ash hardwood V2 type - this  
9 one would have more species and it would have them more  
10 evenly distributed. The other type, black spruce,  
11 leatherleaf sphagnum type would have fewer species in  
12 total and tend to get a lot of a few species.

13 Look at the spruce trees, for instance,  
14 almost nothing but black spruce there, no ash, none of  
15 the other species that are ordinarily found in the  
16 forest. So that's an example of diversity within a  
17 patch, within an ecosystem, within a stand.

18 The other kind of diversity relates to  
19 diversity in the landscape. Gosh, this map is getting  
20 pretty marked up. Essentially here you have two kinds  
21 of landscapes which is why I picked this example.  
22 There is one down in this corner. Let's use a  
23 different coloured pen.

24 This one in here, which is a lot of  
25 mineral soils, and some wetlands and this has several

1 different kinds of ecosystem and it has more kinds of  
2 ecosystems than this type out here which is mostly  
3 muskeg, black spruce bog and there isn't much else in  
4 there.

5 So here you have -- within the ecosystem  
6 you could have fewer kinds of organisms and less evenly  
7 distributed. Here you have fewer kinds of ecosystems  
8 and less evenly distributed. So you can have diversity  
9 within a stand, within an ecosystem or you can have  
10 diversity on a landscape level.

11 Q. Is the landscape level diversity also  
12 known as between stand diversity?

13 A. That was the term that I used in my  
14 written testimony because I thought it would be  
15 relatively clear. It isn't a widely used technical  
16 term, no. Ecologists have some other names for these  
17 diversities, but they go with Greek letters and they  
18 tend to be rather confusing.

19 Q. You have contrasted the diversity  
20 found within V38 stands and V2 stands. You have  
21 indicated that the V38 stand may be species poor in  
22 comparison to the V2 stand.

23 Does that mean that stands like V38  
24 stands are less important in maintaining biodiversity  
25 and that they don't have to be protected or retained in



1 the landscape?

2 A. No, on the contrary. There are  
3 numbers of species that can only find their homes in  
4 the absence of a lot of competition and the pitcher  
5 plant, which I mentioned, is a fascinating example of  
6 this. You will find it in acid bogs because basically  
7 when there is less acidity around the other parts of it  
8 get going and the pitcher plant doesn't stand a chance.

9 I always thought that it was a plant that  
10 was exclusively in a bog; in other words, in  
11 Newfoundland I found it growing on extremely alkaline  
12 sites on the steep side of a mountain and then  
13 realized, as I guess other people have before me, that  
14 it is really just seeking refuge from the other  
15 organisms. It can exist in either extreme, but not in  
16 the middle where most organisms live.

17 So you have numbers of these sorts of  
18 species that find a home, that find a niche in very  
19 special environments. Those environments may be  
20 completely lacking in diversity within the environment,  
21 but they nevertheless afford a place, a niche, a home  
22 for particular kinds of organisms, special kinds.

23 Q. Why is it important to maintain  
24 biodiversity in that manner?

25 A. It is important to -- you are talking

1 about biodiversity just generally or...

2 Q. That's correct.

3 A. Biodiversity is in many ways  
4 fundamental to our existence. As a species worldwide  
5 we rely on so many different kinds of organisms for all  
6 the resources we use, that we must conserve them.

7 We have to, for instance, conserve wild  
8 cereals because they are the breeding stock for making  
9 new kinds of wheat, we have to conserve wild plants in  
10 their native environment because we know statistically  
11 that a great many of these contain pharmaceuticals that  
12 are yet to be discovered and there are hundreds of  
13 common wild plants that have afforded us invaluable  
14 cures, periwinkle, foxglove, a wild yam in Mexico that  
15 provided the first birth control pills ultimately; all  
16 sort of species that are used in those ways.

17 In addition to that, there is an  
18 aesthetic imperative that people around the world, lots  
19 of people just enjoy the variety of organisms around  
20 them. They thrive on that, they like it.

21 There is an ecological imperative in that  
22 each of these organisms in great or in lesser ways  
23 provides functional amenities, if I can say, in the  
24 landscape and it is very difficult to dismiss any  
25 organism as being inherently bad. There might be a few

1       like small pox or AIDS. Even if you take something  
2       like a black fly, we know that male black flies go  
3       around pollinating blueberry plants. So who's to say  
4       black flies are all bad. Everything has its use.

5                       Finally, there is probably -- I would say  
6       there is a morale imperative to preserving  
7       biodiversity. There is probably room enough for us all  
8       if we work at it.

9                       Q. Nwo, in Forests for Tomorrow  
10       condition No. 25, biological diversity has been defined  
11       as including genetic diversity, species diversity,  
12       structural diversity and ecosystem diversity and  
13       encompasses all species of plants, animals, fungi and  
14       micro-organisms and the ecosystems of which they form a  
15       part.

16                      Do you support that definition of  
17       biodiversity?

18                      A. Yes, do I.

19                      Q. Okay, thank you. Do you support the  
20       statement in condition 25(2) that would require the MNR  
21       to ensure that biological diversity is not reduced or  
22       adversely affected by timber management activities?

23                      Q. Yes, I would support that.

24                      Q. Does that mean that there should be a  
25       general prohibition on logging throughout the entire

1 province?

2 A. No, I don't think it does. I am sure  
3 it doesn't.

4 Q. In general terms, how can timber  
5 management be carried out in a manner so as to maintain  
6 biodiversity?

7 A. Okay. I would like to draw something  
8 at the moment. Do we have any blank transparencies.

9 If we look at the change that diversity  
10 that might occur with disturbance -- this is where you  
11 will see how poor I am as a draftsman.

12 We could draw a conceptual graph like  
13 this where this would represent a small area, this  
14 would represent a large area. This axis will be time,  
15 this will be small time and a large one.

16 If we look at large areas over long  
17 periods of time, and we are talking here maybe up in  
18 this corner, about the global situation, we would  
19 expect or like, at least in a historical time period,  
20 there to be no change.

21 If we looked at intermediate levels, we  
22 would expect to have a low change in diversity over,  
23 say, regions over periods of a century or something of  
24 that sort or several centuries.

25 If we come down to a forest district or a

1 management unit or something like that, we would not  
2 like to have large changes, but we might be able to  
3 permit some kind of intermediate change in diversity or  
4 the state of the system.

5 When we come down to very small areas, a  
6 stand over five years or a year, 20 years, we could  
7 permit extreme variations here. In fact, that would be  
8 normal and that's part of the working of nature.

9 So given that logging works, you know,  
10 drastically at this level in terms of what it does to  
11 an ecosystem - I don't mean that in a pejorative sense,  
12 I just mean it can cause great change - then that  
13 extreme change is just fine on a small area over a  
14 relatively small period of time.

15 Q. Do you support the FFT wildlife  
16 objective which is to ensure that no wildlife  
17 populations decline in the long term at the provincial  
18 level or within forest management units, ecodistricts  
19 or ecosystems as a result of timber management  
20 activities?

21 A. Yes.

22 Q. Now, in the definition --

23 MR. MARTEL: Which number is that, Mr.  
24 Lindgren?

25 MR. LINDGREN: That is 25(3) found on



1 page 21.

2 Q. Now the FFT definition of biological  
3 diversity includes functional and structural diversity.

4 Now, Mr. Maser in his attendance before  
5 the Board discussed the structural and functional  
6 importance of snags and fallen logs.

7 In your opinion, can within stand  
8 diversity be maintained by the retention of snags and  
9 down and woody material and other structural elements.

10 DR. SUFFLING: A. I think that the  
11 retention of those elements is a necessary, but not  
12 necessarily a sufficient part of maintaining diversity  
13 within an ecosystem.

14 Q. Do you support FFT conditions 29 and  
15 30 which would require the MNR to ensure the retention  
16 of an adequate number and distribution of snags and  
17 dead and down woody material within the forest?

18 A. Yes.

19 Q. You have indicated that that's not  
20 the be all and end all. What else has to be done in  
21 your view in order to maintain biological diversity?

22 A. Essentially the approach has to be  
23 landscape approach and this is because you are not  
24 dealing with a static system, you are dealing with a  
25 dynamic changing system and what is mature now will

1 later on be just starting out on the part of  
2 succession, and so there will be a constant turn-over.

3 If that is to be the case, you can't  
4 worry too much about the state of an individual patch  
5 or ecosystem unless there is something really special  
6 there you want to look after. You are much more  
7 concerned with the picture in the whole landscape and  
8 whether the landscape as a whole is healthy and is  
9 functioning well.

10 Q. I would like to move on to page 54 of  
11 your witness statement. At the top of the page you  
12 have refer to stand replacing disturbance and you  
13 indicate that stand replacing disturbance can suppress  
14 between ecosystem diversity.

15 A. Right.

16 Q. First of all, can I ask you what you  
17 mean by stand replacing disturbance?

18 A. A stand replacement disturbance, and  
19 it is sometimes called - probably not very  
20 appropriately - catastrophic disturbance, is a  
21 disturbance that takes away most or all of the -- not  
22 takes away, it changes most or all of the above-ground  
23 structure of the ecosystem.

24 Typical examples would be a crown fire,  
25 clearcut logging, severe wind storm, lethal insect

1 attack in a mono specific stand, in a stand with only  
2 one species of tree.

3 Q. How does the stand replacing  
4 disturbance, such as large area clearcutting, impact  
5 upon the between ecosystem diversity that you have  
6 described?

7 A. It does so in several ways. At the  
8 level of individual stands you get this kind of effect.  
9 This is some of the work from one of my grad students.  
10 It is actually based in Manitoba, but it is about five  
11 miles west of the Ontario border, so it is probably  
12 much the same system that we are looking at.

13 Q. This is page 9 of the hand-out.

14 A. Just as an example of what he was  
15 doing. You have a mature stand of trees here with a  
16 lot of structure in it and you have an immature stand  
17 of trees created in this case by logging and there is a  
18 very sharp boundary or ecotone here which results.

19 Now, if the two patches are very  
20 different like this, then the contrast between them is  
21 quite extreme or very noticeable not only to us, but to  
22 organisms using those areas and that can be very  
23 important ecologically.

24 If, in contrast, the ecotone between two  
25 stands is between, let's say, an 80 year old spruce

1 stand and a 60 year old spruce stand, then although the  
2 boundary will still be there, in wildlife terms in  
3 particular, it will be much less noticeable and that's  
4 what Mr. Brown found in his research.

5 There are also differences, incidentally,  
6 between the kind of ecotone that was created by  
7 logging, by fire.

8 MADAM CHAIR: Excuse me, Dr. Suffling.  
9 Is that noticeable to your analytical eye or much less  
10 noticeable to the movement of habitat or...

11 DR. SUFFLING: I'm sorry, I don't follow  
12 you.

13 MADAM CHAIR: You were talking about  
14 ecotone being more or less noticeable.

15 DR. SUFFLING: More or less...

16 MADAM CHAIR: Noticeable you said.

17 DR. SUFFLING: This is a two-year old  
18 clearcut and this is a mature stand pf trees. You must  
19 have seen this in your field visits in the north. A  
20 very straight edge of trees, eventually it is quite  
21 probably that some of these on the edge will blow over  
22 and soften the edge, somewhat making it a little more  
23 blurred.

24 If, on the other hand, this event occurs  
25 when these trees are just 20 years old, later on you

1 would end up with, say, an 80 year old stand here and a  
2 60 year old stand in this other half of the plot here  
3 and the difference between the two would be almost  
4 imperceptible. You would probably find that most lay  
5 people would not see it walking through the forest.

6 MADAM CHAIR: That's why I am asking --

7 DR. SUFFLING: A forester or an ecologist  
8 might.

9 MADAM CHAIR: When you are looking at the  
10 ecotone and describing it, you are doing that visually?  
11 You are saying that looks like an extreme difference.

12 DR. SUFFLING: We are doing that visually  
13 and statistically, but this is the kind of difference  
14 that you wouldn't need any statistics to see it.

15 MADAM CHAIR: Thank you.

16 MR. LINDGREN: Q. Dr. Suffling, can I  
17 ask you whether or not the -- doe the provision of high  
18 contrast edge, does that necessarily benefit all  
19 wildlife species?

20 DR. SUFFLING: A. No. It will help  
21 species that tend or that "like" to be found along  
22 those edges. It won't necessarily help those that  
23 require the interior patches.

24 Now, your question had -- the original  
25 question that you asked, I was going to answer it in



1 two parts and I lost the gist of what you had said.

2 You were asking about have diversity between patches?

3 Q. Yes. I was wondering how stand  
4 replacing disturbances such as large area clearcutting  
5 impacts on between stand or between ecosystem  
6 diversity?

7 A. Okay. So the ecotone part was one  
8 half of the response to that question.

9 The other thread, if you like, would be  
10 to take a whole landscape, such as this one, and this  
11 has not been logged, incidentally, so I am just using  
12 it for illustration. If one were to log a large patch  
13 in here, there would be differences between sites, but  
14 they would be much less than you observe in the natural  
15 forest because they have all been reduced to the same  
16 age class at the same time.

17 Therefore, the only differences that you  
18 would see would be to differences in drainage and soils  
19 and so on, not due to the development time or the  
20 successional process. The diversity in that patch  
21 would in all likelihood be reduced.

22 Q. Through cutting and conversion to a  
23 single age class?

24 A. Through conversion to a single age  
25 class.

1                   Now, having said that, if we take it just  
2                   a little further, you find in fact that the total  
3                   amount of diversity in the landscape is very much  
4                   dependent on the amount of disturbance that you get.

5                   Q. This is page 10 of the hand-out.

6                   A. So looking here to start with. This  
7                   end of the graph represents an extreme amount of  
8                   disturbance, very high. This data point here comes  
9                   from somewhere around the Berens River, which is  
10                  perhaps -- in northwestern Ontario it is maybe one of  
11                  the most fire prone regions in the forest.

12                  Then if we look down at this end of the  
13                  graph, there is a very low rate of disturbance not on  
14                  the Hudson Bay lowlands, but just adjacent to it, much  
15                  further east in a more humid climate.

16                  If we plot the landscape diversity,  
17                  that's the diversity between stands, you find that it  
18                  is low with very low disturbance. The reason is that  
19                  all of the forest tends to run to a mature stage and  
20                  there is very little disturbance.

21                  If you look at an extremely high rate of  
22                  disturbance up here on the Manitoba border, everything  
23                  gets burnt generally before it can mature completely.  
24                  So the whole landscape tends to be in an immature  
25                  state.

1                   Inbetween that you have an intermediate  
2 amount of disturbance and here, for instance, around -  
3 oh, I don't know, Red Lake going east to Martin's Falls  
4 or something like that, then you would find a very  
5 high, relatively high amount of diversity between  
6 stands.

7                   Now, the implication of this is that if  
8 you increase the amount of disturbance here in a high  
9 disturbance landscape you will force the diversity of  
10 the landscape downwards. If you do the same thing in  
11 an almost undisturbed landscape, you may increase the  
12 disturbance.

13                  Now, if this is done through logging, you  
14 can see that the effects can be diametrically opposite  
15 between on which landscape you were working in. It  
16 isn't a simple situation, but in either case,  
17 presumably all things being equal, you would be  
18 departing from what is natural and you will have to  
19 realize that and be prepared for it if that was the  
20 decision.

21                  MR. LINDGREN: Thank you. Perhaps we can  
22 break here for lunch, Madam Chair.

23                  MADAM CHAIR: Yes. We will be back in an  
24 hour and a half.

25                  ---Luncheon recess at 12:05 p.m.

1 ---on resuming at 12:35 p.m.

2 MADAM CHAIR: Thank you. Please be  
3 seated.

4 Mr. Lindgren.

5 MR. LINDGREN: Thank you, Madam Chair,  
6 Mr. Martel.

7 Q. I have a few questions, Dr. Suffling,  
8 arising out of our discussion this morning and I would  
9 like to put a series of questions to you.

10 First of all, in your opinion can  
11 clearcutting change the vegetation structure, age and  
12 composition of a stand relative to its former state?

13 DR. SUFFLING: A. Most certainly, yes.

14 Q. Can that be done in a manner which  
15 alters ecotones, changes movement corridors and  
16 disturbs wildlife populations?

17 A. Yes.

18 Q. Is that more likely to result from  
19 large area clearcutting?

20 A. I think the effects will be more -- I  
21 am sure the effects will be more pronounced with the  
22 larger clearcuts.

23 Q. Can artificial regeneration and  
24 vegetative -- or vegetation management on the cut-overs  
25 also stress or adversely affect wildlife species that

1 could survive in forest conditions that result from  
2 natural regeneration?

3 A. Yes. That is the case because some  
4 of the tending procedures that have followed are  
5 actually designed to impact plants that are needed by  
6 certain kinds of wildlife.

7 When I was doing my Ph.D research we were  
8 working on power lines with a brush control herbicide  
9 called Tordon, and one of the things that this did was  
10 quite deliberately knock out broad leafed plans.

11 So prior to the spraying we had a power  
12 line that was very analogous to a clearcut in many ways  
13 and had a lot of uses by foxes actually eating berries  
14 on the plants on the right-of-way. The area was also  
15 stuffed with rough grouse and they were particularly  
16 found, for instance, in June and July of eating  
17 raspberries.

18 In fact during the spraying, during that  
19 period of the year, of course we never saw either of  
20 those two species because the plants that has attracted  
21 them in the first place were not there anymore or were  
22 greatly reduced.

23 So given that that kind of application of  
24 brush control happens deliberately to knock out broad  
25 leafed species and encourage conifers, you can expect



1 those kind of effects in clearcut, too.

2 Q. To address those concerns, do you  
3 support strategy 1 and strategy 2 as described by Dr.  
4 Middleton and as set out in FFT conditions 26 and 27?

5 A. Yes, I do. Strategy 1 essentially  
6 looks after the whole landscape. Strategy 2 is  
7 designed to pick up those species which are of economic  
8 value or are rare, threatened or endangered or perhaps  
9 have some particular intrinsic local interest.

10 Q. Now, I understand to this point your  
11 evidence has focused on the underlying ecological basis  
12 for landscape management.

13 Can you perhaps summarize your views and  
14 conclusions with respect to the ecological basis for  
15 the landscape approach?

16 A. Okay.

17 MR. LINDGREN: Madam Chair, these are new  
18 overheads and we will provide copies at the break.

19 DR. SUFFLING: I have tried to stress,  
20 Madam Chairman, the importance of managing the  
21 landscape at the ecosystem level and indeed at the  
22 landscape level to stress that you cannot really manage  
23 a landscape for all of its components unless that level  
24 is, in fact, addressed.

25 As a corollary of that I have

1 demonstrated that the landscape is a dynamic mosaic and  
2 that has been done in fact by other witnesses in other  
3 contexts. The mosaic is indeed dynamic; it is not  
4 static.

5 The landscape in northern Ontario is not  
6 in equilibrium; that is to say, it doesn't necessarily  
7 remain the same way now and in 40 years time and in 80  
8 years time. There are climate changes and other  
9 stresses that are occurring that change the equilibrium  
10 quite independently of anything that we might do in the  
11 way of forest management and that's why you get these  
12 graphs with a declining area of young age classes.

13 Now, since the current outbreak of  
14 massive forest fires in the last decade, the shape of  
15 that graph can be expected to start changing again.  
16 Because of this, because of increases in fire that we  
17 are not sure at the moment, but may or may not be  
18 caused by global warming, we have to watch out for this  
19 as a factor and recognize the fact that to some extent  
20 increased forest fires from global warming combined  
21 with harvesting activities will probably greatly  
22 increase the amount of disturbance in total in the  
23 landscape and that has very real and very important  
24 consequences that we either have to live with or avoid  
25 in some way.

1                   So fire will probably be increasing and  
2           large fires in particular will tend to add to the  
3           disturbed area or, perhaps more accurately, large  
4           clearcuts will add to the area of large patches that  
5           would otherwise be disturbed by these larger fires.

6                   These fires, of course, are very rare in  
7           terms of their numbers, they don't occur very often,  
8           but in terms of the total area that they occupy they  
9           are very important in the proportion of the total area  
10          that they use up.

11                  Moving on a little. There are two kinds  
12          of diversity that we have identified. First of all,  
13          within stands of trees or indeed within marshes or bogs  
14          or other ecosystems and between the ecosystems in the  
15          forest context largely between stands of trees. Both  
16          of these kinds of diversity are important, but there  
17          are some sort of exceptions or additions that we need  
18          to point out.

19                  One of these is that non-diverse  
20          ecosystems, like the example with the black spruce bog,  
21          would be unique in many cases and some of the species  
22          that are in those areas will be most unusual in other  
23          areas or totally unique to those areas. Also, and this  
24          isn't generally appreciate, disturbance can either  
25          raise or lower landscape diversity.

1                   Now, most people think that disturbance  
2           is going to result in some kind of increase in  
3           diversity. It can be the case and it can be otherwise.  
4           If your landscape is here on this curve and you add  
5           disturbance, you are going to cause the diversity to  
6           fall.

7                   If, on the other hand, your landscape is  
8           at this point, a very low disturbance value, and you  
9           add more disturbance, then the total diversity would  
10          tend to rise. In the middle here, whether you add  
11          disturbance or whether you decrease it, you will get  
12          less diversity. You are talking there of the landscape  
13          levels.

14                   Lastly, fire and harvesting together - I  
15          guess this is just a repeat of what I have just said -  
16          can raise or lower the diversity and that has extremely  
17          important implications in management.

18                   So that summarized what I tried to get at  
19          in my written testimony in the first half and also in  
20          the evidence-in-chief which has just been given.

21                   Q. Thank you. I would now like to turn  
22          to the issue of the operational implementation of the  
23          landscape approach, and can I start by asking you  
24          whether or not the Ministry of Natural Resources  
25          presently has at its disposal the elements of a



1 comprehensive and consistent ecological land  
2 classification system?

3 A. It has at its disposal, either with  
4 instruments that the Ministry itself produces like the  
5 forest resources inventory or with instruments that it  
6 can easily get ahold of, it has many of the elements  
7 that are needed to provide such a classification and  
8 management system.

9 Also, many of the tools that will be  
10 needed to implement such a system are in existence and  
11 many of them are in quite a sophisticated state. There  
12 is, however, a need to hitch these different components  
13 together to round out the system and to get the whole  
14 thing working as a whole.

15 Q. Now, in Appendix 1 of your witness  
16 statement, which commences at page 63, you detailed and  
17 described the tools that are presently available and  
18 this includes FRI and FEC.

19 Can you briefly describe these tools and  
20 can you indicate the advantages and disadvantages  
21 associated with each tool as they presently exist?

22 A. Okay. I put a heading on this  
23 overhead of land management systems. I am not sure in  
24 retrospect that it was entirely appropriate. These are  
25 really information systems. The management comes



1 later.

2 MR. LINDGREN: This is page 12 of the  
3 hand-out, Madam Chair.

4 DR. SUFFLING: Now, these are not all of  
5 the systems that are available, but these are some of  
6 the obvious ones to refer to.

7 First of all --

8 MADAM CHAIR: Excuse me, Dr. Suffling,  
9 can you just repeat what we are comparing here.

10 DR. SUFFLING: We are comparing different  
11 systems here for reducing basically maps or map based  
12 information that can then be used at an ecosystem level  
13 or management. It is worth pointing out, too, that  
14 much of the information from these systems could in  
15 fairness be used in other approaches such as habitat  
16 supply analysis. So they are very basic.

17 This one here, forest resource inventory,  
18 is very much a work course in silvicultural management.

19 Now, I have picked three different kinds  
20 of systems here to look at. The first one, the forest  
21 resources inventory, is one that we have looked at  
22 in -- and you must have seen in detail for many months.  
23 It's advantages are that it is working right now, it is  
24 a long standing system, the informations is available  
25 on maps which are basically annotated Ontario base maps

1 and the information is also available on computer disk  
2 and can be pullewd off that way for other uses.

3 The scale in terms of land management is  
4 a very useful one. It was designed for this purpose.  
5 It runs at 1:15,000. I am not sure. It was 15,840 at  
6 one time.

7 Now, the next system also has advantages,  
8 this is the forest ecosystem classification, and this  
9 is a relatively new system. It is designed to manage  
10 forest systems from a silvicultural point of view, but  
11 with more of an overall approach, more recognition of  
12 various components in the ecosystem other than the  
13 trees alone.

14 So it looks at soils, it looks at the  
15 whole of the vegetation, not just the trees but the  
16 other layers as well, and it produces two -- actually  
17 two different classifications; one of vegetation and  
18 one of soils. These can then be combined in various  
19 ways for management purposes.

20 So it, too, has advantages. It can  
21 provide detailed information, much more so than than  
22 the FRI, it can provide some information on non-timber  
23 values and this in fact could be expanded in a future  
24 version of the system to include animals, for instance.

25 It is ecologically based, much more so

1       than the FRI. Unlike the FRI, it classifies the  
2       ecosystems into types. The FRI merely describes what  
3       is there, and I say merely. There has an enormous  
4       amount of work to get the FRI going, but it is better  
5       able to do this than the FRI because it is looking not  
6       just at the trees, but at other components of the  
7       ecosystem as well.

8                       Now, these two systems, the Canada and  
9       Ontario land inventories, I have included for a  
10      specific reason. They use a hierarchical division of  
11      the land into ecologically and geomorphologically based  
12      categories and we will talk a little more about this I  
13      am sure in moment.

14                     The point is that what you end up with is  
15      a hierarchical system, small units of land that, if  
16      necessary, from a management point of view can be  
17      aggregated together into bigger and bigger units. This  
18      is like following a tree back from the small branches  
19      from the leaves, to the twigs to the branches to the  
20      big stem and then to the main trunk. So you can  
21      gradually aggregate the land base in the whole of  
22      Canada together, and obviously as you do so you get  
23      more and more general, less and less specific about  
24      what is on the land.

25                     Again, it is a system that's working now.

1 It is based upon this concept of the hierarchical  
2 classification of the land, which the federal  
3 researchers who have done most of the work call  
4 ecological land classification or ELC. It is  
5 hierarchical and importantly from a land management  
6 point of view, it was designed and adapted specifically  
7 for making planning decisions.

8 Now, a further strength that all of these  
9 systems have is that -- sorry. All of them can be used  
10 in GIC based models. They are all spacial, potentially  
11 so, this one not so much, but they can all be put into  
12 a GIC and all used separately or in conjunction.  
13 Now, that's the good news.

14 MR. FREIDIN: Sorry, which one did you  
15 point to which could not be used as readily?

16 DR. SUFFLING: The FEC at the moment  
17 cannot be used as readily.

18 MR. FREIDIN: Thank you.

19 DR. SUFFLING: Not because of any  
20 inherent problem, but just because the maps and so on  
21 have not been done basically in any many areas. It is  
22 a new system.

23 Now, the disadvantage of the FRI in the  
24 first place is that although it describes all the  
25 stands, it doesn't make any attempt to classify them.



1 That's not an insuperable problem, as will be seen from  
2 a map that I will be using later on. It only looks at  
3 what the foresters call the main stand.

4 So if you had a main stand, a thick stand  
5 of balsam fir, maybe six or seven metres high and then  
6 over the top of that you had a bunch of scattered  
7 poplar trees which were very much taller and perhaps  
8 older, then it would only talk about the main stand, it  
9 would ignore the rest, and it wouldn't talk about the  
10 regeneration under beneath. So there is very limited  
11 information there.

12 The last point to make here, and these  
13 are just salient points, there are a lot of others that  
14 could be gone into, is that the FRI does not do very  
15 much to classify non-forested sites. So we find muskeg  
16 lumped together, although it is actually a number of  
17 wetland types, and marshes put together and developed  
18 agricultural land all put together in bucket and there  
19 is a lot that could be done to separate these out if it  
20 were useful.

21 Problems with the FEC. It has been  
22 developed for the northwestern region, for the  
23 northcentral and for bits and pieces of the Clay Belt  
24 and Algonquin. There are some maps, individual  
25 scattered maps of FEC data, but as a system it is not



1 yet to the point where major areas are mapped  
2 consistently throughout. That is not an inherent  
3 problem, it is just that it is a new system and  
4 probably people have really not got that far.

5 Another problem from an ecological point  
6 of view is that it doesn't consider young stands or  
7 trees. It doesn't look at anything under 40 years of  
8 age. Again, it's not insuperable, it could be changed,  
9 it is just that the people designing it had specific  
10 aims in mind and they didn't consider the young stands  
11 to be that important from their viewpoint.

12 There is possibly a more difficult  
13 problem here, the regions where the FEC was developed  
14 were by and large developed independently of each  
15 other. There is some liaison between the northwest and  
16 northcentral, but the other two tend to be a little  
17 disjunct in the terminology that they use and some work  
18 will be needed to pull those together on a very uniform  
19 taxonomy.

20 Now, we come to the land inventories.  
21 The approach in the two is much the same and the  
22 distinction really goes back to -- I guess to political  
23 arrangements and how the work was to be done. So I put  
24 them together for this purpose.

25 They work at a small scale relative to

1 the others, so they tend to be more general and they  
2 look at the potential of the landscape. I will get an  
3 overhead up in a moment and I will show you what I mean  
4 by that.

5 So you are not looking at what is on the  
6 land, but maybe what could be achieved. There are six  
7 or seven different kinds of maps that are produced.  
8 One will be for the capability for ungulate production,  
9 another one for fisheries, fresh water fisheries, a  
10 third one for recreation or agriculture for forestry  
11 and so on. So for each of those factors you can see  
12 what the land might do under an assumed level of  
13 management. That is important an assumption and,  
14 again, it doesn't tell you what is there, it tells you  
15 what might be done.

16 The featured species approach which dates  
17 in this case from about 20 years ago is, in our view,  
18 somewhat outdated. That's the approach that looks at  
19 ungulates and wild fowl and so on.

20 So that's a run-down on some of these  
21 systems. What's available. There is a big tool box  
22 out there with lots of potential.

23 Just to recap on the land inventories --

24 MR. LINDGREN: This is page 11 of the  
25 hand-out, Madam Chair.

1 DR. SUFFLING: These will give you a  
2 better indea of what they are about. I think you are  
3 familiar, are you not, with the other two systems?

4 MADAM CHAIR: Yes.

5 DR. SUFFLING: Do I need to go over this  
6 one or has it come up before?

7 MADAM CHAIR: Yes, this has come up  
8 before. You can discuss it very quickly.

9 DR. SUFFLING: Okay. This is just one of  
10 the kinds of maps. This one is for capability for  
11 ungulates. The units here on the land can be  
12 aggregated together to produce more generalized units,  
13 eventually going up to the ecoregion level, which  
14 presumably will be discussed a little bit later, and we  
15 have seven classes of capability, from one so seven.

16 In addition to the limitations, one being  
17 the highest and seven the most limited, there are  
18 various annotations that go on, like this one here,  
19 which says this piece of land is class 6 and that is  
20 for moose and deer, it is class 6, and it has  
21 limitations because of soil depth and moisture and I  
22 think fertility. So there is quite a lot of  
23 information there.

24 MR. LINDGREN: Q. Can I ask you, Dr.  
25 Suffling, to turn to the 1991 ESSA report which is

1 entitle A Plan of Research into the Effects of Timber  
2 Management on Wildlife, and it is marked as Exhibit  
3 1714.

4 Can I ask you to turn to page 22 of that  
5 document.

6 DR. SUFFLING: A. Right.

7 Q. Can you confirm that this a similar  
8 chart detailing or outlining the capabilities of the  
9 existing landscape classification schemes?

10 A. Yes. It is much more detailed, of  
11 course.

12 Q. Are you in general agreement with the  
13 description therein contained?

14 A. Yes.

15 Q. Okay. And next I would like to  
16 turn -- bring to your attention the discussion of the  
17 FEC system that we find on page 23 and page 24.

18 At the top of page 24 there is a  
19 description of some of the limitations of FEC, the  
20 limitations that you have described, and then under the  
21 heading Recommended Research, the author recommends  
22 that the first major research need is to make the FEC  
23 system complete for forested lands.

24 Stopping right there. Can I ask you if  
25 you are in agreement with that research priority?

1 A. Very much so.

2 Q. Then below that, we see that the  
3 second major research need is to add non-forested lands  
4 to the lands classification system or scheme.

5 Stopping there. Do you agree with that  
6 research priority?

7 A. I understand that No. 2 says to add  
8 forested land to less than 40 years, et cetera. Are we  
9 looking at the same page?

10 Q. We are looking at the next paragraph.

11 A. I'm sorry, the next paragraph down.

12 Yes, I am in agreement with that.

13 Q. Thank you. Then with respect to the  
14 various landscape classification systems that are in  
15 place right now, can GIS be used to integrate the  
16 information contained within those tools?

17 A. Whenever the original information was  
18 produced on a spacial basis; in other words, it was  
19 capable of being mapped, then it can certainly be used  
20 in GIS.

21 Q. How would that contribute to the  
22 integration of biodiversity and wildlife concerns with  
23 forested land use decision-making?

24 A. That would be -- this is a major area  
25 that needs tackling. Of course, there will be many



1 sub-questions that will come up in that, but basically  
2 what it enables the manager, the planner, the  
3 technician to do and indeed the public ultimately is to  
4 look at different factors on the land to see where they  
5 physically are on the map and then start to make  
6 considered judgments about those -- the implications of  
7 those overlaps.

8 More than that, a very important thing  
9 that GIS has the potential to do is to, if you will, is  
10 to play with the landscape without every getting a  
11 chain saw out to see what would happen if you do this  
12 or that or the other and what are the implications.

13 If the modelling that goes into the  
14 system is accurate and that's -- you know, that's a big  
15 if, but we all have to assume that it would be, then  
16 you can begin to look proactively at the implications  
17 of doing things or not doing things such that you will  
18 begin to know that if we log these 25 stands or if we  
19 don't harvest them, then this will be the implication  
20 for moose production or for the survival of a rare or  
21 threatened or endangered species.

22 Q. Thank you. If I could I would like  
23 to refer you to Exhibit 1715 which is the document  
24 entitled Ecoregions of Ontario.

25 Madam Chair, this is the 1989 publication

1 by Wickware and Rubec.

2 First of all, can I ask you, does this  
3 document represent an ecological land classification  
4 system such as you have described?

5 A. The introduction to the document  
6 gives quite a clear and, given its length, quite a  
7 comprehensive description of ELC in Canada and its  
8 development. So it is a good summary to understand the  
9 systems as a whole.

10 Q. Dr. Suffling, are there any  
11 particular comments you would like to make about this  
12 document?

13 A. First of all, I would just draw your  
14 attention to two pages in the document that are  
15 probably quite important from the point of view of  
16 today's proceedings.

17 On page 3, there is a table that outlines  
18 the different hierarchical zones in ecological land  
19 classification. I always find it very difficult to  
20 take it in on an abstract level, so we will look at a  
21 map in a moment.

22 You start off with the ecozone level  
23 which looks at huge areas of the land surface. From  
24 our point of view, we don't have to worry too much  
25 about this. Then the ecoprovince which, again, is very

1 large, and then we come down to the ecoregion level.

2 Now, this is the largest natural unit of  
3 the landscape that is likely to be generally used in  
4 management in Ontario and there will be about -- I  
5 guess about 20 of these in Ontario. The map over there  
6 on the board, do you know -- I guess it has the same  
7 exhibit as the report; doesn't it?

8 MR. LINDGREN: Dr. Suffling is referring  
9 to the map that is displayed on the board and that is  
10 the map that is attached to Exhibit 1715.

11 DR. SUFFLING: That is an addendum to the  
12 printed report that we are talking about, and the  
13 different colours on the map represent ecoregions.

14 Just as a for instance, the lowlands  
15 along the shore of Lake Ontario, which they are in at  
16 the moment, represents one ecoregion. It is a big area  
17 inherently.

18 Then we come down to an ecodistrict and  
19 this is the sort of level at which you might start to  
20 see this as coincident with some of the larger forest  
21 management units.

22 Dr. Middleton, if you would like to  
23 outline the Berens River ecoregion. We can then  
24 subdivide that. You will be able to see that it <KOPB>  
25 <S\*ES> consists of I think four or five districts.

1                   So while he is doing that, then we can  
2           come down to the ecosection which is part of an  
3           ecodistrict of which there is a recurring pattern of  
4           terrain and with that go particular soil, water and, of  
5           course, biological conditions.

6                   MS. BLASTORAH: I'm sorry, Dr. Suffling,  
7           could I just stop you there for a minute.

8                   I may have misunderstood, was Dr.  
9           Middleton to outline the ecodistrict or the ecoregion?

10                  DR. SUFFLING: No, he has outlined an  
11           ecoregion. I thought he was going to outline the  
12           districts. I beg your pardon.

13                  MS. BLASTORAH: Thank you.

14                  DR. SUFFLING: A little communication  
15           problem I'm afraid.

16                  So below the ecodistrict level, which is  
17           what he has just outlined, where we have ecosections  
18           which are not marked on the map, then we come down to  
19           an ecosite which is a unit having a relatively uniform  
20           parent material, soil and hydrology, and there is a  
21           fancy term here, the same chronosequence of vegetation.  
22           Basically the same kind of succession.

23                  Somewhere around level and the one below  
24           is where we find individual stands and the ecoelement  
25           is a subdivision of the ecosite. So those are the

1 hierarchical divisions within ecological land  
2 classification.

3 The next page that I bring to your  
4 attention to is Table 2, which I think is on page 4,  
5 and it shows essentially that the kind of information  
6 that one would generally use to gather information  
7 about these areas would change as their scale changes  
8 and so, too, would the scales of mapping.

9 Now, when we are talking about scale here  
10 there tends to be semantic problems. Small scale is a  
11 large area like looking down from high up in a high  
12 altitude plane. Some people use it the other way  
13 around. Large scale would be coming down close looking  
14 at a small area with a magnifying glass.

15 Q. Thank you. Perhaps I can ask you to  
16 put on your first overhead again.

17 A. This one? (indicating)

18 Q. Yes. Now, FFT condition 25(1)  
19 reproduces the definitions of ecodistrict and  
20 ecosection.

21 A. What page was that on, please?

22 Q. This is page 20 to 21 in the terms  
23 and conditions.

24 Stopping right there. Can I ask you if  
25 the ecodistrict and ecosection scale or level, is that



1 an appropriate management level?

2 A. For many kinds of management, yes.  
3 Sometimes, of course, one would want to go down lower  
4 in the hierarchy. Ultimately, if you were - I don't  
5 know - putting in a hiking trail or something, you  
6 would want to look a lot lower, but initially, yes.

7 Q. And FFT condition 25(4) indicates  
8 that:

9 "The MNR should replace forest management  
10 units with ecosections or, where  
11 appropriate, ecodistricts whose size,  
12 shape and boundaries shall reflect  
13 ecosystem integrity."

14 Do you support that condition?

15 A. Yes. I'm not hung up on the names or  
16 the exact level that we use because those are a system  
17 that in a sense we are trying to impose on the land and  
18 nature has its own patterns, but providing the  
19 management areas corresponding with natural ecological  
20 and geomorphological regions, yes.

21 Q. I would also like to briefly refer  
22 you to page 20 of the 1991 ESSA report.

23 A. Okay.

24 MS. BLASTORAH: Sorry, what page was  
25 that?

1 MR. LINDGREN: Page 20.

2 MS. BLASTORAH: Thank you.

3 MR. LINDGREN: Q. On page 20 we see a  
4 description of Exhibit 1715, the Wickware and Rubec  
5 ecological land classification system, and at the  
6 bottom of the page there is a statement that:

7 "It is appropriate to use the above  
8 classification categories as a  
9 classification framework for lands in  
10 Ontario."

11 Do you agree with that statement?

12 DR. SUFFLING: A. Yes.

13 Q. Thank you. Do you have any other  
14 comments with respect to the map of the ecoregions of  
15 Ontario?

16 A. Not at this time, no.

17 Q. Thank you. With respect to  
18 predicting landscape change, can you indicate how this  
19 could be done in a manner that integrates concerns  
20 related to biodiversity and ecosystem supply analysis?

21 A. Okay. There are models that could be  
22 produced that will give a very useful kind of output.

23 Now, this is a model that we did about 10  
24 years ago and it is not be all and end all of all  
25 models and I'm not suggesting that it is a particularly

1 good or particularly bad model, but it gives you an  
2 idea of the kind of output that can be produced.

3 The study that I am referring to was a  
4 study of the effects of the logging industry on  
5 trappers and one of the things that we needed to know  
6 initially was how was the landscape, how were the  
7 ecosystems that the trappers were using going to change  
8 with respect to logging.

9 Q. This page 14 of the hand-out.

10 A. So for a lowland system, that's  
11 essentially wetland with peaty soils, in northwestern  
12 Ontario, we start off with this circle here which gives  
13 you the proportions of four different basic kinds of  
14 ecosystems and then we look at scenarios for how those  
15 would change.

16 First of all, we run the model and we let  
17 it rip with no fire control, no logging, nothing, just  
18 to see what happens. In this case the prediction was  
19 for -- more or less more of the same.

20 In the next scenario, we take it through  
21 from a past state here to the present and then we apply  
22 fire control but without doing any logging. Now, that  
23 situation of no harvesting but fire control was one  
24 which is contained in this particular study area until  
25 very recently and you can see that there are changes,

1     albeit relatively small ones, in the proportions of  
2     ecosystems. One of them, the past change, is actually  
3     beginning to get quite large.

4             The third situation is to run the model  
5     from a reference point here in the past to the present  
6     and then in the future with logging and with fire  
7     control at the same time and, again, we see that there  
8     are certain differences between the three results here;  
9     Not dramatic, but there are some differences that need  
10    to be addressed.

11            So those are the kinds of outputs that  
12    our model can give you in terms of proportions of  
13    ecosystems. We took this on a little further, not  
14    within the computer, but within our predictions to look  
15    at what the implications were of those landscape  
16    changes for individual trappers in terms of their  
17    likely success in gather animals from the wild.

18            The nuts and bolts of a model of that  
19    kind are fairly standard. You start off with a chart  
20    in the computer and if this represented the age of the  
21    ecosystem, essentially succession, and this is a kind  
22    of ecosystem - sorry, I will have to move this - then  
23    you would get transitions from one kind of ecosystem to  
24    another at different times.

25            So an ecosystem of this age might exist

1 here and here, but these other types would not occur.  
2 From this, if you could work out the likelihood of an  
3 ecosystem proceeding from one state to another during  
4 succession, and that can be figured in different ways  
5 as a transition matrix as it is called. So you can  
6 work out the probability of different changes  
7 happening.

8 You can have one of these tables that  
9 would tell you what would happen to forest with no  
10 management and another one that would tell you what  
11 would happen with certain kinds of forest management,  
12 and a third one that would look at the different kinds  
13 of forest management, and then that is the guts of the  
14 model that produces the results that I just alluded to.

15 These kind of transitions can be what we  
16 call deterministic. You just say how they are going to  
17 be and you make them happen, or more accurately perhaps  
18 they can be probabilistic. There are a lot of things  
19 that we don't quite understand or who knows what runs  
20 it, but sometimes an ecosystem will go from A to B and  
21 sometimes it will go from A to C and there is no rhyme  
22 or reason to it that we can discern, but we know that  
23 it will do one 30 per cent of the time and the other  
24 one 50. So you can build a lot of sophistication into  
25 models of this kind and you can verify how accurate



1 they are.

2 Q. In your opinion, should silvicultural  
3 modelling tools such as OWOSFOP be integrated with  
4 ecosystem supply modelling tools so that you have an  
5 ability to produce alternative landscape types or  
6 patterns?

7 A. OWOSFOP doesn't do the whole job. It  
8 does a lot of the job and it does it well. It has been  
9 designed as a root supply model, not an ecosystem  
10 model. So obviously from that point of view alone it  
11 would need modifications or additions to make it useful  
12 in other contexts.

13 I am not suggesting that there is  
14 anything at all wrong with the model as it is run, but  
15 if you wanted to do other things you would have to  
16 tinker with it, but at the same time, yes, I would say  
17 it is probably capable of being modified.

18 Q. Should the modelling of alternatives  
19 be done for the 5 and 20-year time frames for a plan or  
20 should it go beyond that?

21 A. Can I just expand on my last answer a  
22 little bit before we go on to that one?

23 Q. Sure.

24 A. There is a new generation of models  
25 coming on stream at the moment and one of the pieces of

1 paper that you have been given this afternoon, this  
2 paper by Glen Jordan --

3 MR. LINDGREN: That's Exhibit 1728, Madam  
4 Chair?

5 DR. SUFFLING: Dr. Jordan is a researcher  
6 at the University of New Brunswick and he has taken  
7 FORMAN, which is one of the standard models and he has  
8 adapted it to have a spacial component.

9 So that using GIS he is able to not only  
10 model the amount of wood that will be coming out of the  
11 system, but also to model what the landscape looks like  
12 at different times and then, as I mentioned earlier, to  
13 essentially tinker with the landscape in the computer  
14 and see what the various things would do to the  
15 landscape and whether or not they are acceptable or  
16 benign or beneficial and so on.

17 Q. Can I ask you whether or not that  
18 sort of modelling should be done at the 5-year level or  
19 the 20-year level or at some point beyond that?

20 What's the time frame that we are looking  
21 at here?

22 A. I would say that the modelling should  
23 be done at all levels from 20-year intervals down to  
24 5-year intervals and also possibly on a yearly basis.  
25 That might be debatable, the last one, but certainly on

1 a 5-year basis.

2 The sophistication or the weight that's  
3 given to the model results will verify perhaps with the  
4 amount of time that you are looking into the future.  
5 Obviously the crystal ball gets clouded as you get  
6 further out.

7 Q. And if the modelling and planning and  
8 selection of alternatives is done upfront, would you  
9 still need an annual work schedule or something like  
10 that to implement the planned activities?

11 A. Yes, I think you would and there are  
12 very good reasons for this. I mean, first of all,  
13 there is the major disruption of the area, the  
14 unexpected large fire. That really requires a rewrite  
15 of the forest management plan, but beyond that there  
16 are a lot of smaller things that can happen and they  
17 are quite normal.

18 The pulp and paper industry, for  
19 instance, goes through about an eight- to a nine-year  
20 economic cycle. So it may be that in certain years  
21 they will be wanting to cut like mad and then in other  
22 years they will lead economically to rain themselves  
23 in, and likewise you may get a very dry year that  
24 causes regeneration problems and/or late frost and that  
25 would need to be compensated for in the following year

1 by extra planting. There might be a strike that might  
2 affect activity in the forest and you might want to  
3 catch up up the year after. Lots and lots of  
4 unexpected occurrence that require constant attention  
5 to the details of the plan.

6 Q. And with respect to the modelling of  
7 alternatives using GIS, I understand that you want to  
8 refer to some of the maps attached to the Willamette  
9 Forest Management Plan.

10 Madam Chair, the final environmental  
11 impact statement has been marked as Exhibit 1716A and  
12 Dr. Suffling will be referring to two of the maps which  
13 have been included in 1716D.

14 DR. SUFFLING: I don't think you will  
15 fine the maps there, Ma'am. They were in a large  
16 package. We have one copy of it. There are more  
17 coming.

18 MADAM CHAIR: Thank you. We do have  
19 this, Dr. Suffling, I just can't put my...

20 MR. LINDGREN: Actually that is the  
21 single copy.

22 MADAM CHAIR: Oh, this is the copy.

23 MR. LINDGREN: That is the copy. Dr.  
24 Suffling was removed two of the maps showing  
25 alternative landscapes that were outlined and described

1 in the forest management planning.

2 Q. Dr. Suffling, can you go to the maps.

3 DR. SUFFLING: A. I was going to get Dr.  
4 Middleton to do the pointing. He is very good at such  
5 things; steady hand.

6 What you are looking at here is a map of  
7 the Willamette National Forest. It is a large  
8 forested, mountainous area in the American northwest in  
9 Oregon, I believe. It is, in fact, the largest  
10 national forest in the contiguous United States. It is  
11 also one of the first to go through a new forest  
12 planning and management system which they titled rather  
13 snappily, New Perspectives, and the maps here are two  
14 of a large series of alternatives that were produce as  
15 part of the environmental impact assessment for that  
16 forest plan.

17 The one on the right-hand side represents  
18 the no-change alternative. So that would be steady as  
19 you go, no changes in management or policy.

20 The one on the left-hand side is  
21 alternative W which was the one that was actually  
22 adopted as a new management plan.

23 Now, in talking about these maps I am not  
24 really making any judgment about the wisdom or lack of  
25 wisdom in the choices that are adapted. The point is



1 to show you that the original forest data and a lot of  
2 original data on social economic conditions, wildlife  
3 and so on were incorporated into a GIS system, that the  
4 various constraints and opportunities presented by  
5 those different resources were then overlaid to produce  
6 rationale alternatives, and when I say rationale I mean  
7 that you make a number of assumptions about the  
8 policies to be followed, the management to be followed,  
9 and then the map falls out of that, it comes from that,  
10 and you have an alternative to which the manager or the  
11 public or the politician can respond.

12 So the two alternatives produce much of  
13 the same in many cases, but there are some differences.

14 John, would you point to that river  
15 system there which was formally marked just as a sort  
16 of higher scenic area, a higher scenic quantity and  
17 then under the new plan is marked as being a  
18 recreational corridor with water interest.

19 So the planning and management situation  
20 with that block of land has been changed. If you look  
21 at the map in detail you see many such differences  
22 between alternatives.

23 Now, this setting of alternatives using  
24 GIS, which is perhaps the most powerful tool for doing  
25 this, is one of very great promise. I will give you

1 another example which doesn't come from forestry at  
2 all, but illustrates the societal usefulness of this  
3 and this comes from the Crombie Commission which is  
4 sitting in the Toronto area and is trying to unravel  
5 the immense problems that the region was has in terms  
6 of growth.

7 Now, of course ever municipality in the  
8 area wanted to have growth and all the mayors and  
9 reeves were all gung-ho on this. So the first stage  
10 was to run a model which would enable them to think  
11 through the consequences of that. So they asked for  
12 their assumptions about how many roads they wanted, how  
13 many dwelling units, how much industry and so on.

14 They stuffed it all into the model and  
15 what came out was this horrendous megalopolis with all  
16 sorts of problems that were obvious to the naked eye  
17 and they said: All right, that's what you want  
18 collectively. Is that really what you want, and  
19 according to the story I heard they sort of threw their  
20 hands up in horror and said: No, that is not what we  
21 want, let's look at something different.

22 It was exactly what the planners involved  
23 wanted them to do. They wanted to bring them to the  
24 point of understanding the consequences of different  
25 compromises that had to be made. So that's, if you

1       like, the political value of these GIS maps, that you  
2       can keep tinkering and you can keep compromising or not  
3       compromising and see what comes out.

4                   Q.   Now, you have described the two  
5       Wallamette national forest maps to the Board, and I  
6       understand you wanted to refer to some work done by  
7       Hydro to illustrate where we are in Ontario?

8                   A.   Yes.  If you could turn those maps  
9       over please, Dr. Middleton.

10                   MR. LINDGREN:  Madam Chair, before Dr.  
11       Suffling commences, I would like to distribute the next  
12       exhibit which describes some of those maps.  It is a  
13       document entitled An Integrated Approach to Forest  
14       Classification using Digital Forest Resources Data and  
15       Landsat Imagery.  It is dated November 1990 and the  
16       authors are R.N. Pierce and D. Sulter.

17                   MADAM CHAIR:  Thank you, Mr. Lindgren.  
18       That will be Exhibit 1731.

19       ---EXHIBIT NO. 1731:  Document entitled An Integrated  
20                                Approach to Forest Classification  
21                                using Digital Forest Resources  
22                                Data and Landsat Imagery, dated  
23                                November 1990 and the authors are  
24                                R.N. Pierce and D. Sulter.

23                   MR. LINDGREN:  Q.  Dr. Suffling, could  
24       you please proceed to discuss the two maps we were  
25       looking at.

1                   Perhaps, Madam Chair, while we are at it,  
2                   the colourful map on the right has been marked as  
3                   Exhibit 1724 and I would ask that the green map to the  
4                   left be marked as the next exhibit.

5                   MADAM CHAIR: That will be Exhibit 1732.

6                   MR. LINDGREN: This is a map entitled  
7                   Reclassified Forest Resource Inventory, 1987 data. It  
8                   basically covers the same area as Exhibit 1724.

9                   MADAM CHAIR: The date on that was which,  
10                  Mr. Lindgren?

11                  MR. LINDGREN: I think the map is  
12                  produced in 1990. It is based on 1987 FRI data and it  
13                  relates to an area to the northeast of Cochrane,  
14                  Ontario.

15                  ---EXHIBIT NO. 1732: Map entitled Reclassified Forest  
16   Resource Inventory based on 1987  
17   FRI data relating to an  
  area to the northeast of  
  Cochrane, Ontario.

18                  DR. SUFFLING: The point of bringing  
19                  these two maps out, Madam Chairman, is to go one stage  
20                  further than the Willamette situation, one stage back  
21                  really in terms of preparation.

22                  The Willamette National Forest example  
23                  shows that GIS can be used effectively in an ecosystem  
24                  level management or landscape level management using  
25                  ecosystems.



1                   What these two maps show is that the data  
2           that need to go into the GIS concerning natural  
3           systems, forest systems and the like can be and indeed  
4           are available for parts of Ontario, and in those parts  
5           where they are not available they could be made  
6           available. These data were produced in-house by  
7           Ontario Hydro and there are really two different data  
8           sets which I will address separately.

9                   Their purpose in doing this is to find  
10          better ways of routing power lines. They are following  
11          an ecosystem approach in doing this.

12                  The map on the left, John, is produced by  
13          the GIS system and by another system called Ariaze --  
14          I'm sorry, just the GIS system. Basically what they  
15          have done is to take an FRI map, to digitize it and  
16          then put it into the GIS system, and by asking the GIS  
17          system a number of questions they have got it to  
18          classify the original FRI data into forest types.

19                  Now, if you remember I said that FRI,  
20          although it described the forest, it did not classify  
21          it. So now they have pushed the data a little bit  
22          further and they have taken it to the point where, for  
23          instance, you can see a large clearcut there on the  
24          left which is fairly uniform but with one or two  
25          islands of mature forest and a couple of different



1 kinds of habitat within it, and then at the top right  
2 there is a blue area which represents a lake, just so  
3 you know what that is, and below that to the right is a  
4 peninsula of mature conifers, mostly spruce. That,  
5 again, has been identified.

6 The level of detail obviously can be no  
7 greater than the level in the FRI maps and so you see a  
8 certain amount of generalization there.

9 The original data of course here were air  
10 photos and they were hand and eye interpreted. The  
11 other alternative on the right is the same kind of  
12 classification of forests. It is a little more  
13 detailed, certainly spacially perhaps not quite so much  
14 in terms of number of categories.

15 The way that this was produced was to  
16 take a landsat image, satellite image which is not  
17 really a photo, but a series of data that was sent down  
18 represented a scan line like lines on a television.  
19 They then classified those data into different forest  
20 types through a rather complicated procedure that we  
21 can discuss if you want, but I don't think it is  
22 necessary, and they produced a map of the different  
23 forest types. So they go from essentially this image  
24 of the landscape here (indicating) to a map of the  
25 landscape of different forest types.

1                   There is a high degree of congruency  
2           between the two maps that are produced by different  
3           methods from different kinds of original data; air  
4           photo on the left, Landsat imaging on the right. Just  
5           the GIS system on the left and then the area image  
6           analysis on the right followed by a GIS system.

7                   So you have two reasonable, practical  
8           methods of classifying forests fairly rapidly and at  
9           reasonable cost. Those go into the GIS system and  
10          starts to make land use maps and so on.

11                   MR. LINDGREN: Madam Chair, I would ask  
12          that the Landsat image be marked as Exhibit 1733.

13                   MADAM CHAIR: What's the date on that?

14                   MR. LINDGREN: The image is dated June  
15          1987. It relates to the Cochrane area and it is the  
16          basis for Exhibit 1724.

17          ---EXHIBIT NO. 1733: Landsat image dated June 1987  
18                                   relating to the Cochrane area  
19                                   and is the basis for Exhibit  
                                  1724.

20                   MR. LINDGREN: Q. Dr. Suffling, does  
21          the --

22                   MADAM CHAIR: Excuse me, it is the basis  
23          for Exhibit 1732.

24                   MR. LINDGREN: 24.

25                   MADAM CHAIR: 24. Okay, thank you.

1 MR. LINDGREN: Q. Dr. Suffling, you have  
2 indicated that these maps represent the technology and  
3 the tools used by Ontario Hydro in relation to corridor  
4 planning and sighting.

5 Does this technology have any relevance  
6 or utility for timber management planning?

7 DR. SUFFLING: A. Yes, I think so. The  
8 scale is appropriate. In fact, in one case it is the  
9 same data base that the Ministry people are using.

10 The kinds of ecosystem that are  
11 classified out and identify as map categories are  
12 within limits and are more or less appropriate to the  
13 kind of management that's envisaged, and also the image  
14 on the right, the one that was produced from the  
15 satellite, has the capability to map marshes, bogs,  
16 agricultural land, anything else that comes up.

17 Q. And I understand that you want to  
18 make a comment on the Abitibi GIS map that has been  
19 marked as Exhibit 1652D in this hearing?

20 A. Yes, please.

21 MR. LINDGREN: You might recall, Madam  
22 Chair, this map was part of a series of maps filed by  
23 the Industry in their cross-examination of Professor  
24 Benson.

25 DR. SUFFLING: Just two brief points

1 here. The first is that you have an Ontario base map  
2 here which has been stuffed into a GIS system and this  
3 is being done by Abitibi, one of the major forest  
4 companies.

5 They could just as easily have put the  
6 FRI categories onto it to and they have gone to some  
7 pains here to identify clearcuts and different kinds of  
8 regeneration, different kinds of treatment that they  
9 have done. This illustrates one of the further big  
10 advantages with GIS, that it can be updated and used at  
11 rapid increments, perhaps annually or bi-annually.

12 MR. LINDGREN: Q. In your opinion, Dr.  
13 Suffling, having regard for the Abitibi map and the  
14 Hydro maps, is the technology available in Ontario to  
15 implement a landscape management and planning approach?

16 DR. SUFFLING: A. Yes. All of the  
17 hardware is there, some of the software.

18 Q. I have a few final questions for you,  
19 Dr. Suffling. First of all, Mr. Marek and Professor  
20 Benson in their evidence before this Board discussed  
21 FFT's silvicultural prescriptions in some detail and  
22 these are the prescriptions found in conditions 15 to  
23 21.

24 Leaving aside the particulars of those  
25 prescriptions, can you indicate how or when they would

1 fit into the landscape planning approach?

2 A. Okay. I am just refreshing my memory  
3 on exactly what these were. Because basically when you  
4 have some constraints like this as to size of clearcut  
5 or difference of one treatment from another or anything  
6 of that sort, you could put these rules into a GIS  
7 system and so you can be aware immediately if the rules  
8 that you supply are being transgressed, or  
9 alternatively you can instruct the system in terms of  
10 software to pick out all the available sites of such  
11 and such a type and then you can either manually or  
12 automatically make a selection of those.

13 So as a management tool it really enables  
14 you to do what I was talking about before, to tinker  
15 with the forest without every laying a finger on it.  
16 Is very compatible.

17 Q. Now, through the interrogatories you  
18 were asked, what would happen where a natural patch  
19 size would be larger than the permitted patch size  
20 under the FFT silvicultural prescriptions.

21 Madam Chair, this was OFAH interrogatory  
22 No. 47, sub 5 and it is found on page 12 of Exhibit  
23 1717.

24 Dr. Suffling, the answer indicates that  
25 where there is a conflict between natural patch size



1 and the permitted patch size under the FFT terms and  
2 conditions the smaller limit would apply.

3 Do you have any comments on that?

4 A. Yes, I think in the first place this  
5 relates back to the point that I was making this  
6 morning, that in some sense, not in every sense, small  
7 clearcuts tend to replace or to act as a surrogate for  
8 small fires. Not in every sense, but in some senses.

9 The habitat effects can be reasonably  
10 different or quite different. However, when it comes  
11 to the large patches, then there is this difficulty  
12 that the large fires tend to be there anyway and so  
13 there should not be an emphasis on thinking that one is  
14 necessarily going to replace large fires with large  
15 clearcuts.

16 The second point to make is that an awful  
17 lot of natural disturbances are mostly fire. The great  
18 majority of them are very small, you know hectares,  
19 even less than hectares. If we are to mimic nature,  
20 than that should be the way with our clearcutting  
21 procedures at least, that we should have a lot of small  
22 clearcuts but very, very few, very sparing large ones.

23 Q. My second last question for you has  
24 to do with Appendix 2 of your witness statement which  
25 sets out the criteria for landscape management and this

1 morning Dr. Middleton went through some of those.

2 A. I have lost my witness statement.

3 DR. MIDDLETON: (handed)

4 DR. SUFFLING: Thank you. Appendix 2?

5 MR. LINDGREN: Q. This is found on page  
6 64.

7 A. Okay.

8 Q. Without going through each of these  
9 criteria, can you indicate what the overall intent or  
10 rationale is behind these criteria?

11 A. Okay. Basically what we are trying  
12 to do here is to show that you could have a number of  
13 policies or rules that would apply to ecosystem  
14 management at the landscape level or with the landscape  
15 approach.

16 Each rule tends to specify a limit to the  
17 amount of change that could be tolerated in the  
18 landscape, at the same time allowing considerable  
19 flexibility to vary between upper and lower limits.

20 So the idea here is to give the forest  
21 industry enough flexibility that they can still make a  
22 profit and do their work fairly easily without too many  
23 constraints, at the same time, to protect the landscape  
24 to make sure that some of the things which we see  
25 happening with current management and fear for the

1 future would tend not to happen in the future.

2 At the same time, there is a certain --  
3 you will notice on a geographical level there is a  
4 difference in the specificity of the rules depending on  
5 whether you are dealing with a single hectare somewhere  
6 or a whole region. So that the idea is to try and  
7 protect each region, each district in the same way, but  
8 then to allow for the ecological and economic fact that  
9 on a particular stand, on a particular hectare of land  
10 there may be massive change over time.

11 Q. My final question for you, Dr.  
12 Suffling is this: We have heard from Dr. Bendell and  
13 from Dr. Middleton that landscape management is a  
14 direction that Ontario should be going in. Do you  
15 agree with those gentlemen?

16 A. Yes, I do. I think it's essential.

17 Q. Dr. Middleton, my final question to  
18 this panel is to you and it relates to the ESSA 1991  
19 document, Exhibit 1714, and you will notice that every  
20 page indicates that this is a draft plan.

21 If the MNR implemented the various  
22 research initiatives outlined in this document and if  
23 the results of the research were used by the MNR in a  
24 landscape management approach, would you and would FFT  
25 be satisfied?

1 DR. MIDDLETON: A. Speaking for myself,  
2 certainly. I have been very impressed by both this  
3 document and the process from which it has come.

4 I think if the important aspects of that  
5 procedure were to continue, especially things like the  
6 openness and the clear convergence of ideas that went  
7 on in the same way, I think we would have an excellent  
8 result out of it.

9 MR. LINDGREN: Madam Chair, those are my  
10 questions for this panel.

11 MADAM CHAIR: Thank you, Mr. Lindgren.

12 We will take our afternoon break now, and  
13 then are you prepared to cross-examine, Mr. Hanna,  
14 after the break?

15 MR. HANNA: Yes, Madam Chair.

16 MADAM CHAIR: All right. We will take  
17 our 20-minute break and start when we get back.

18 ---Recess at 2:45 p.m.

19 ---on resuming at 3:05 p.m.

20 MADAM CHAIR: Please be seated.

21 Mr. Hanna?

22 MR. HANNA: (indicating)

23 MADAM CHAIR: Mr. Lindgren?

24 MR. LINDGREN: Madam Chair, one final  
25 housekeeping matter. I have placed on your desk hard

1 copies of the four overheads that Dr. Suffling drew  
2 during the course of his evidence. It is a four-page  
3 document and, as I have indicated, I would ask that  
4 that be marked as Exhibit 1734.

5 MADAM CHAIR: Thank you, Mr. Lindgren.

6 ---EXHIBIT NO. 1734: Four-page document consisting of  
7 hard copies of the four overheads  
8 that Dr. Suffling drew during  
the course of his evidence.

9 MR. HANNA: Good afternoon, Madam Chair,  
10 Mr. Martel, Members of the Panel.

11 Madam Chair, before I begin, I believe in  
12 my original estimate that I had indicated that I might  
13 be up to three days cross-examining this panel. That  
14 estimate has been greatly diminished. I knew that  
15 would cause the Board some anxiety, but I may be  
16 finished before the end of the day tomorrow.

17 Dr. Quinney has kept me informed of the  
18 evidence and it appears that some of the matters that  
19 we felt might be in dispute may not be in dispute and I  
20 should know that fairly shortly.

21 MADAM CHAIR: All right, Mr. Hanna.

22 CROSS-EXAMINATION BY MR. HANNA:

23 Q. I hate to start off my  
24 cross-examination, Panel, with a carrot, but I am going  
25 to start off with a carrot.



1                   The carrot is basically this: I have  
2 taken from the evidence that's been presented by this  
3 panel that collectively you are not opposed to managing  
4 for certain species provided that that is carried out  
5 within the context of an overall landscape management  
6 context.

7                   Is that a fair summary of the message,  
8 Dr. Middleton and Dr. Suffling?

9                   DR. MIDDLETON: A. Yes, I think that's a  
10 fair estimate.

11                  Q. Now, there are two issues of  
12 particular concern that I want to address with you.

13                  The first I want to address is I want to  
14 make sure that I understand how the criteria that you  
15 have set out, both Dr. Middleton and Dr. Suffling, in  
16 terms of the boundaries within which the landscape must  
17 be maintained, how it interfaces with the stand  
18 specific decisions and I would also like to explore in  
19 terms of what those criteria mean in a broader sense in  
20 terms of how binding and how constraining they might be  
21 in a practical sense.

22                  I am going to start with the broad issue  
23 first, if that's all right. As I understand it, Dr.  
24 Middleton, you have set out the criteria that you would  
25 like to see directing the landscape management on page

1 41 of the witness statement and there are seven that  
2 you have actually -- there are six there, but there is  
3 a seventh one I believe that Dr. Suffling has included;  
4 correct?

5 DR. MIDDLETON: A. Could you give me the  
6 page number again, please.

7 Q. Page 41.

8 A. Thank you.

9 Q. Those are the operative criteria that  
10 you have proposed to this Board that they would include  
11 in their decision as the boundaries within which the  
12 stand specific management would have to operate; is  
13 that fair?

14 A. Let me clarify again. Basically  
15 fair, yes. Let me clarify again, as I did when I gave  
16 the evidence, that there are two stages to what I was  
17 talking about.

18 One of them was a general procedure for  
19 attacking the whole issue and then there was the second  
20 level of detail. The more detailed level I  
21 acknowledged at the time to be more of a starting point  
22 than was the greater principle.

23 These idea, the six or seven that you  
24 have identified on page page 41 are my starting points  
25 for thinking about this issue. I explained that in the

1 context of the ESSA procedure, for example, and so on  
2 that I am confident that these will be fine tuned as we  
3 go along. With that proviso, I will agree with what  
4 you have said.

5 Q. I will come back to fine tuning them,  
6 but let's think positive, that the Board's decision is  
7 going to come before the end of the ESSA research  
8 project, and in that event we are going to have to  
9 adopt something in the decision, and is it fair to say  
10 that this is what you are proposing as the measure  
11 until further refinement, if further refinement is  
12 possible, occurs in the future?

13 A. The primary measure is the one which  
14 the Ministry of Natural Resources has also put forward,  
15 that as far as -- as closely as possible the  
16 disturbance regime for forestry will be that of the  
17 natural disturbance regime.

18 This is a second stage beyond that which  
19 is to say if we are not absolutely perfect in that  
20 first one, how much fuzz around that ideal can we have  
21 as acceptable at the first stage. Again, in this  
22 context these will be a starting points in the way that  
23 you have described.

24 Q. So these are the boundaries within  
25 which we must obtain the forest landscape until we

1 refine them otherwise, with the proviso that you made?

2 A. These are the boundaries that would  
3 guide drawing of management plans and I make the  
4 distinction because, of course, the final outcome of a  
5 five-year plan would be at a considerable stage in the  
6 future and it is only what we are doing today that  
7 would be under the context of our greatest ignorance at  
8 the starting point.

9 I can clarify that clearly if I didn't  
10 get it across. If we are dealing with these management  
11 plans in an adaptive way, as information becomes  
12 available to find tune these things, that can be  
13 incorporated even within the context of year to year  
14 updating of a plan which is set today.

15 Q. All right. Keep that thought because  
16 I am going to come back to how we would refine these,  
17 but I would like to go through them individually first,  
18 if I could.

19 I am going to refer to Appendix 2 which  
20 is in Dr. Suffling's component. I believe the  
21 criterion are the same and I am quite prepared to have  
22 either you or Dr. Suffling respond.

23 They are for all intents and purposes the  
24 same criteria; correct?

25 MADAM CHAIR: Which page are you on, Mr.

1 Hanna?

2 MR. HANNA: Page 64, Madam Chair.

3 MADAM CHAIR: Thank you.

4 DR. SUFFLING: Mr. Hanna, they are the  
5 same with the exception of a couple of words. If  
6 anybody quibbles about it we can explain it.

7 MR. HANNA: Q. But the message is the  
8 same?

9 DR. SUFFLING: A. Yes.

10 Q. I would like to look then first at  
11 the first criterion which deals with the change in the  
12 area of ecosystem types; correct?

13 DR. MIDDLETON: A. The first one is  
14 actually about elimination of ecosystem types.

15 Excuse me. There is a difference in  
16 numbering between the two versions.

17 Q. I'm sorry. Can we look at page 64  
18 and go through it because they are listed there one to  
19 seven and that was the ones that I was referring to  
20 here.

21 Is there one, perhaps Dr. Middleton  
22 before I go, that you have listed that's not in  
23 Appendix 2?

24 A. I believe not.

25 DR. SUFFLING: A. I'm not sure. I can



1       recheck them while you are answering.

2                   Q.   Now, just looking at criteria 7 for a  
3       second, it applies to all six criterion; correct?

4                   DR. MIDDLETON:   A.   That's correct.

5                   Q.   And as I understand it, the process  
6       that you are putting forward is hierarchical both in  
7       terms of the classification system and in terms of the  
8       testing of whether the criteria have been met; is that  
9       fair?

10                  A.   If by the latter you mean that the  
11       test will be made at each hierarchical level, that is  
12       correct.

13                  Q.   Yes.   Just as an example, you are  
14       suggesting it has to go from the ecosection level to  
15       the provincial level.   So that when we were, for  
16       example, proposing a timber management plan in any  
17       particular year, as part of that preparation one would  
18       have to report on each of the six criteria for  
19       ecosection, ecodistrict and ecoregion in the province;  
20       is that correct?

21                  A.   Dr. Suffling can also add his  
22       comments here.   That is not strictly correct.

23                         It does not follow that there would be a  
24       province-wide, for example, updating every year for all  
25       these criteria, for the simple reasons that it may be

1 that the changes at the provincial level will not  
2 accumulate through time at the same rate that the ones  
3 in the smaller areas will; that is to say, the changes  
4 are likely to be most rapid on the smallest areas on  
5 the ground and progressively slower as we get to larger  
6 areas.

7 So I don't think it follows necessarily  
8 that the same interval of updating of plans and  
9 feedback of the information would occur at the  
10 provincial level as it does at the stand level, for  
11 example.

12 Q. Okay. What level or what frequency  
13 of reporting and testing are you proposing at each of  
14 the levels?

15 A. I'm not proposing any specific one.  
16 This goes beyond the level of specificity that I tried  
17 to address in mine.

18 It would be -- if I were to venture a  
19 start to that answer, I would say the levels, the time  
20 intervals would be chosen appropriate to the scale of  
21 change at each of the levels and there would be some  
22 tradeoff, there would be some rough correlation between  
23 the geographical and the time scale in each case; that  
24 is, bigger, less frequently.

25 Q. Dr. Suffling, this is open to both of

1       you. I am directing the questions to Dr. Middleton,  
2       but I want both you to add here because I don't want to  
3       go over the same ground with each of you individually.  
4       If there is something that you want to add to the  
5       answer, please do so.

6                       DR. SUFFLING: A. Perhaps I could  
7       clarify that issue that came up initially about the  
8       numbering.

9                       Q. Yes.

10                      A. First, taking page 41 of Dr.  
11       Middleton's evidence. The first rule or criterion does  
12       not appear in the appendix.

13                      When I was writing my appendix, the only  
14       reason that I didn't put that in was because the second  
15       one that says nothing to be reduced to less than 20 per  
16       cent covers it.

17                      The only other difference of any  
18       consequence is that I added a rule about patch shape.  
19       That was meant to have been cleaned up in the drafts,  
20       but it was missed somehow.

21                      Q. Excuse me, I want to make sure I  
22       understand. Should the patch shape criteria be in or  
23       out?

24                      A. It's in, but it only appears in the  
25       appendix. That's just an error on our part.

1 Q. That's fine. But you want to include  
2 that criteria as a criteria that you would want  
3 achieved?

4 A. Yes.

5 DR. MIDDLETON: A. Yes.

6 DR. SUFFLING: A. Can we work just from  
7 the appendix now?

8 Q. Yes, that's what I prefer to do.

9 Now, the question I asked Dr. Middleton  
10 while you were working on the other task, Dr. Suffling,  
11 was the frequency at which compliance with each of the  
12 six criterion would need to be reported, and I started  
13 at the provincial level and Dr. Middleton I think said  
14 he didn't see it was necessary to report that each time  
15 a timber management plan is prepared.

16 Is that your your view?

17 A. Which preparation do you mean? Can  
18 we just clarify that.

19 In the timber management planning  
20 exercise you basically have a 20-year span that's  
21 indicated and a 5-year consideration and then a 1-year  
22 working paper; right? Which time interval are you  
23 talking about?

24 Q. A timber management plan is approved  
25 on a five-year basis.

1                   A. You are talking about the five-year  
2 basis?

3                   Q. Just before you go on here, I just  
4 want to make sure I understand how you see these  
5 criteria kicking into the timber management planning  
6 process because I will tell you that all of my  
7 questions today and probably for the rest of this  
8 hearing will deal with the operational side of timber  
9 management planning. That's where I am coming from.

10                  A. I understand.

11                  Q. So I am trying to understand how  
12 these criterion will interface with that planning  
13 process.

14                  A. Okay.

15                  Q. I am looking at it from the point of  
16 view of a unit forester preparing a timber management  
17 plan and having sitting before him a decision from the  
18 Board that captures these criterion and what he has to  
19 do to comply with those criterion.

20                  A. I understand, okay. There are really  
21 two answers to your question.

22                  The first one that he can deal with deals  
23 with the situation right now. I think the frequency  
24 with which these should be considered has not really  
25 been considered in any detail.



1                   If we were to look at a five-year  
2     planning horizon and if you were dealing with a timber  
3     management unit where there was considerable flux,  
4     considerable change going on because perhaps of  
5     intensive logging at that particular time, then that  
6     would be a very good reason for looking at the criteria  
7     to see how things were going basically, with compliance  
8     in mind, but also of course with a much broader  
9     perspective of wanting to know whether one was doing a  
10    good job.

11                  The second answer is a longer term one.  
12    When some of these tools that we are talking about are  
13    fully integrated, the task of assessing whether one was  
14    in compliance would become much less onerous and it  
15    might be something that could be checked, you know,  
16    very quickly by a technician in maybe a day or two when  
17    everything was on the GIS system.

18                  Q. It is my interpretation of these  
19    criterion that they would come into play each time a  
20    timber management plan was approved which is every five  
21    years?

22                  A. Yes, okay.

23                  Q. Now, the question was simply, when I  
24    am preparing that timber management plan would it be  
25    the responsibility of the unit forester to test whether

1 or not he has met the criterion at the ecosection  
2 level, at the ecodistrict level, at the ecoregion  
3 level, at the provincial level?

4 A. Okay. I understand what you are  
5 driving at. At the level of the management unit,  
6 somebody in the district office or somebody in the  
7 company, it depends on the kind of license, would have  
8 to do that checking.

9 Now, the exact arrangement would, I  
10 imagine, be very much a bureaucratic or procedural  
11 matter within the Ministry and with the company.

12 When it came to reporting, if the data  
13 that we have or would have would be in an electric  
14 format and if the systems through the province were  
15 compatible, then the question of aggregating those data  
16 and checking it would not be to onerous.

17 Now, since management plans would be  
18 prepared across the province for various places at  
19 various times, there wouldn't be a check on a  
20 particular management unit unless it happened to  
21 coincide with the provincial check, you know, every  
22 time it was done. You would presumably have a  
23 provincial monitoring that would be done at set  
24 intervals, maybe annually, maybe every five years - I  
25 am not hung up on that - but as long as somebody was

1 running...

2 Q. So is it fair to say that you would  
3 accept a certain degree of variation around the  
4 specific percentages that you have applied here?

5 A. That's --

6 Q. In other words, 10 per cent plus or  
7 minus one per cent type of a...

8 A. Oh. Well, let's say that you are  
9 dealing with a criterion that says between 10 and 70  
10 per cent, just for the sake of argument.

11 Q. Why don't we use one of your  
12 criterion.

13 A. A specific one, okay.

14 Q. Your criterion are 10 per cent.

15 A. Let's start with No. 1:

16 "No ecosystem type will be reduced to  
17 less than 20 per cent of its original  
18 area or increased to more than 500 per  
19 cent."

20 Q. I am not concerned about the limit.  
21 I understand there is a range inbetween there, but it  
22 is when you get to the boundaries that it becomes  
23 confining.

24 A. Compliance is something that  
25 ultimately the Ministry would have to decide on and the

1 Ministry of the Environment presumably, if they were  
2 involved, but my gut feeling on this is that you have  
3 got the tremendous range there, 20 to 500 per cent.

4 So if somebody was really pushing a  
5 limit, yes I would be sticky on that because I regard  
6 that as a very broad, very flexible or very relaxed  
7 limit in some ways.

8 DR. MIDDLETON: A. Just to follow on  
9 with that. I would agree with Dr. Suffling and it  
10 could perhaps be read as zero change as the central  
11 tendency plus or minus the factor of five; that is tat  
12 these figures are defining that variance and not the  
13 second level of variances around the variance that you  
14 are asking about.

15 Q. But from the sense of providing  
16 direction to the timber management planning process, it  
17 is the constraints at the limits that are going to come  
18 into play.

19 I appreciate what you are saying, that  
20 you would want a central tendency, but on a practical  
21 sense it is going to be the boundaries that are going  
22 to be constraining. You appreciate that?

23 DR. SUFFLING: A. Yes.

24 Q. My question is simply, we have right  
25 now in the province somewhere in the order of a hundred

1 active forest management units, each with timber  
2 management plans being prepared on it at different  
3 five-year intervals and we have this potential large  
4 number of different planning teams preparing plans and  
5 all checking against a boundary that may be a function  
6 of not just their actions, but a whole variety of  
7 people's actions.

8 I am looking at it strictly from the  
9 practical sense, how do we deal with that problem? How  
10 do we come to grips with that type of an administrative  
11 potential nightmare?

12 A. Well, I wouldn't call it a potential  
13 nightmare. I think sometimes the limit them is going  
14 to be crossed; for instance, if you suddenly had a big,  
15 big fire in a single management unit.

16 Now, what that is saying is that not  
17 somebody is going to go down and chop the district  
18 manager's head off the next day. That's not the idea  
19 of it. The idea is to say: All right, we didn't want  
20 more than so many thousand hectares of shrub lands in  
21 this management unit and now we have got 5,000 more  
22 than we wanted. So let's get going and push it back  
23 towards the limit.

24 If the limits were crossed unnecessarily  
25 through some management action where plainly there were



1 alternatives, then I would say from my own part that I  
2 would want somebody's head on a plate. But if the  
3 limits were crossed because of, you know, real  
4 pressures that were very difficult to avoid, then  
5 that's another matter.

6 MADAM CHAIR: Excuse me, Dr. Suffling.  
7 Are you saying that if there were a large fire, a very  
8 large fire, and it exceeded one of these size  
9 limitations, then in fact you wouldn't allow any timber  
10 management, any harvesting to take place that year as  
11 well?

12 DR. SUFFLING: It might be that within a  
13 limited area that would certainly be the case. This is  
14 where the integration between different management  
15 units would be very important because the mill that  
16 depended on that timber supply might then have to  
17 turn -- would then have to turn to an alternative  
18 source and there are precedents for this.

19 You know, there were big fires north of  
20 Thunder Bay around, what, 1980 and Great Lakes Paper  
21 then quite appropriately, rather than just sort of  
22 hammering away at the remaining timber, went up to the  
23 Red Lake area and Lac Seul area and started taking more  
24 timber out of there by rail. Sure, that increased  
25 costs and I know that was a difficult situation, it was

1 for everybody, but it is an appropriate response in  
2 that kind of situation.

3 MR. MARTEL: Are you suggesting that we  
4 are going to or we should - maybe I missed it - that  
5 all of boundaries should be realigned on the present  
6 management units that exist now to follow the landscape  
7 pattern as opposed to the boundaries that we have put  
8 on for certain reasons, whether it was following a road  
9 for a while?

10 I mean, you are talking about a wholesale  
11 change in the management unit as they now exist then?

12 DR. SUFFLING: Ultimately, yes.

13 MR. MARTEL: Okay. Let me just take that  
14 one step further.

15 What does that mean -- didn't MNR  
16 consider doing that a number of years ago when they  
17 were going to redistribute the boundaries and, in fact,  
18 I think they went so far at one time to consider  
19 changing the licenses even to try to bring them in some  
20 kind of uniformity which would supply the mills, and  
21 that's what triggered my question when you mentioned  
22 you might burn beyond.

23 Didn't MNR try that a number of years ago  
24 or certainly consider it a number of years ago, to do  
25 that, and couldn't do that because it was some so

1 complex?

2 DR. SUFFLING: I don't know the reasons  
3 that they didn't follow through on it. I would imagine  
4 that they were essentially political, bureaucratic  
5 organizational rather than anything else.

6 Perhaps the best analogy that we can use  
7 for this is to look at watershed management. Now, I  
8 would imagine if you had turned to a bunch of counties  
9 or municipalities in the 30's or even the early 40's  
10 and said: How about organizing a lot of the activities  
11 that go on in this area on a watershed basis because it  
12 makes sense, they would have all thrown their hands up  
13 and given you three zillion reasons why it couldn't be  
14 done. Nowadays it is perfectly accepted, it is  
15 perfectly logical.

16 I think it would be unreasonable - I am  
17 not speaking for Forests for Tomorrow, but for myself -  
18 I think it would be unreasonable to expect such changes  
19 to occur wholesale in a very, very short period of  
20 time. They could be put through when opportunities  
21 were there and pushed a little faster than would be  
22 natural, just as conservation areas were implemented  
23 one by one as it was deemed appropriate. Conservation  
24 authorities not conservation areas.

25 MR. MARTEL: Have you looked at all at

1 what this would really mean in terms of the number of  
2 units we are really talking about that would be out  
3 there?

4 We have a hundred -- roughly I guess it  
5 is a hundred FMUs right now. How many are we talking  
6 about? Do you have any idea at all, a ballpark figure?  
7 Would it change that substantially or...

8 DR. SUFFLING: Well, again, I can't speak  
9 for Forests for Tomorrow as an organization, you know,  
10 just sitting here as an individual, but it seems to me  
11 that there are going to be a lot of mills that will use  
12 much less than one of these units, one of these natural  
13 units.

14 Some large mills, like Red Rock or Great  
15 Lakes in Thunder Bay, will be drawing supplies from  
16 several of these natural areas. That doesn't preclude  
17 them being gradually managed on a more rationale basis  
18 according to what's on the landscape.

19 MR. MARTEL: But you have no idea -- I  
20 guess what I am trying to get at is some kind of  
21 figure. What are we looking at? I look at the  
22 coloured map there which I think you indicated was the  
23 set -- the sort of landscapes we now have or  
24 ecosystems.

25 DR. SUFFLING: Yes.

1 MR. MARTEL: How much further when you  
2 break those various ones down?

3 DR. SUFFLING: They are not really that  
4 different, you know, in some cases. I mean, I will  
5 warrant it that in many cases they are.

6 If you look at this area here --

7 MS. BLASTORAH: Sorry, Dr. Suffling,  
8 could you just step aside.

9 DR. SUFFLING: Sorry. If you look at  
10 this area here.

11 MS. BLASTORAH: I'm sorry, now I have  
12 blocked Mr. Cassidy's view.

13 DR. SUFFLING: If you look at this area  
14 here, the northern boundary of that, down to here,  
15 that's not so very different from the original Reid  
16 proposal that became the Great Lakes limit.

17 If you look at this one in here, that  
18 isn't so very different from one of the existing  
19 licences. There are differences in detail.

20 Over here, in this area there is a mass  
21 of small -- sorry, down here, mass of small licences,  
22 but there is very little relationship to natural  
23 divisions. Perhaps, you know, the massive licences  
24 there is in itself not a very rationale arrangement.  
25 It's the aftermath of company takeovers and



1 bankruptcies and various things over the years.

2 To say that going according to this sort  
3 of rule is completely irrationale is no worse than  
4 looking at what already exists there.

5 MR. MARTEL: I am just looking at -- if I  
6 look at the types of colours you are using to the  
7 breakdown, I am just trying to figure out how you would  
8 divide, let's say, the area in through Sudbury all the  
9 way up to Timmins, I guess, or close to it?

10 DR. SUFFLING: Sudbury up to Timmins.

11 MR. MARTEL: You have got two units it  
12 looks like.

13 DR. SUFFLING: Yes.

14 MR. MARTEL: How would you break those  
15 down? Would you break them down any further?

16 DR. SUFFLING: Oh, yes, you can break  
17 them down indefinitely because within the ecoregions --  
18 sorry. Yes, the ecoregions, then you have  
19 ecodistricts, smaller areas, within those that you have  
20 smaller districts all the way down to the stand level.

21 So rationally, you know, there is a lot  
22 of room to taking a large ecoregion like this and to  
23 divide off that area there and say: Well, that is  
24 something separate ecologically and geographically.

25 MR. MARTEL: But you would certainly stay

1 away from an overlap between any of those? You would  
2 chop up that brown area, but you would never put the  
3 brown with the light green?

4 DR. SUFFLING: One of the things that  
5 conservation minded people who are not in the forest  
6 industry - I am not trying to tar the people in the  
7 forest industry, I am just talking about people outside  
8 the forest industry - one of things that they have been  
9 pushing and one of the things that some foresters have  
10 been pushing within the district is the idea to use  
11 smaller working circles than the ones that have  
12 previously been used on the basis that they are more  
13 rationale from a management and a timber supply point  
14 of view.

15 Now, if those working circles, for  
16 instance, can be made to correspond with ecodistricts  
17 or smaller units, then that would be all to the good.  
18 That doesn't preclude a mill from drawing timber from  
19 several ecodistricts or several different units.  
20 Indeed it might want to because they might have a need  
21 for different kinds of timber that were not readily  
22 available just from one area.

23 MADAM CHAIR: Dr. Suffling, what prevents  
24 a planner from working with the existing boundaries  
25 with respect to management units and using this as a

1 planning tool but overlaying it on what already exists?

2 Why does this concretely have to be on  
3 paper and used instead of simply being used as a  
4 planning tool?

5 DR. SUFFLING: If I can give you an  
6 example. There was -- I can't give you chapter and  
7 verse offhand, but it is filed somewhere.

8 There was an undergraduate student in our  
9 school doing a senior on his essay, a final year essay  
10 on aspects of natural resource planning in the Sudbury  
11 region, somewhere in here, and they were looking at the  
12 relationship between forest management and lakes and  
13 cottaging.

14 They had to deal with I don't know how  
15 much different agencies that were potentially involved,  
16 and all through the planning area that they were  
17 working with there were different boundaries  
18 boundaries. Every ministry had different boundaries.  
19 Even within the Ministry of Natural Resources at that  
20 time, I don't about now, but at that time some of the  
21 boundaries that were being used by the minerals people  
22 didn't correspond with those used by the forestry  
23 people and so on. It was a complete rat's nest. The  
24 major problem in the work was to try and get data sets,  
25 for instance, that meant anything because nothing

1 jived.

2 Now, to go to an ecologically based  
3 system eventually, and I am not trying to be -- you  
4 know, this isn't something where you can wave a magic  
5 wand and make it happen. I know that there are costs  
6 involved physically and in human terms; changes can be  
7 stressful. It would still be a beneficial thing to aim  
8 towards because ultimately other kinds of activities  
9 that also are predicated on what is on the land by  
10 certain aspects of water management, certain aspects --  
11 most aspects much fur bearer management and so on,  
12 these all relate back to those natural units.

13 If eventually they could be made to jive,  
14 to correspond, then the job of managers and planners  
15 would be very much simplified.

16 MR. HANNA: Q. Dr. Suffling, if the  
17 information is in digital form in a GIS system, is not  
18 the benefit that you have just described largely  
19 negated because by having the information in the  
20 digital form I can superimpose any boundary that I want  
21 and as long as I have the information at the initial  
22 level at which it is collected, which is the way GIS  
23 usually works, is that not right, usually maintained at  
24 its disaggregate level?

25 DR. SUFFLING: A. Yes, sure.

1 Q. Then I can superimpose a different  
2 boundary at my whim; can't I?

3 A. You can superimpose any boundary you  
4 want in the machine, but can you make it work on the  
5 land.

6 Q. This is a question that I want to  
7 pursue that the Board has raised here, is the benefits  
8 of going to a common land base in terms of the  
9 ecosystem units.

10 Do you agree that if you went to that  
11 basis that there may be major costs in terms of access,  
12 major increases in costs in terms of access?

13 A. There could be increases in costs in  
14 certain management units, yes.

15 Q. Particularly if the ecosystem units  
16 were particularly irregular in form?

17 A. Very few of them are.

18 Q. Look at unit 28.

19 A. 28.

20 Q. One of the ones you drew our  
21 attention to. That would be very difficult to access  
22 if that was your company unit; wouldn't it?

23 A. I don't know the road patterns. I  
24 know there are -- there is a major road that transects  
25 it. It goes perpendicular to the area. That's the



1       only one I know of.

2                   Q.   Let's look at it from an ecosystem  
3       management point of view.  What is the disadvantage of  
4       a forest management unit boundary transecting, for  
5       example, unit 48 or 28?  What's the disadvantage?

6                   A.   The potential disadvantage is  
7       initially in not being able to keep track as easily of  
8       what is going on.

9                   Q.   Are you suggesting that the GIS  
10      information for a forest management unit would be  
11      available only for that forest management unit to that  
12      timber management plan and not available to adjacent  
13      planners?

14                  A.   I am suggesting that there is a  
15      strong likelihood that some of the information that  
16      would be needed would be initially and sometimes only  
17      available to, for instance, the district forester and  
18      that the two areas might be different districts or  
19      under different jurisdictions.

20                  Q.   So another way to resolve your  
21      concern would be to ensure that GIS information is  
22      available to adjacent units?

23                  A.   In theory that would be the case.  
24      Knowing the way bureaucracies work, I'm not so  
25      convinced.

1 MR. MARTEL: Would it make it easier for  
2 your forester in drafting any types of manuals or  
3 things that you would be providing for the forester?

4 It would reduce, let's say, a forester  
5 having to deal with a whole variety of different types  
6 of ecosystems then, if you did it this way, in fact in  
7 that whole brown area there would be site specific  
8 things, but basically many of the things that you would  
9 find would be found throughout that entire area, let's  
10 say the brown area?

11 DR. SUFFLING: In some cases, Mr. Martel,  
12 your subposition would be correct because the  
13 ecodistricts that would be identified would not be very  
14 variable in terms of ecosystems that are present now.  
15 There will be exceptions of this and that.

16 In other regions like maybe some of this  
17 area in here running across the north of Superior, you  
18 find even within a district an enormous variation in  
19 the landscape from rocky hill tops to flat land. So  
20 for some people that will be case, for others it would  
21 not.

22 MADAM CHAIR: But if you were getting  
23 data on a stand level basis, there would be less  
24 variation within one stand. There would be some  
25 variation amongst stands, but if you use the stand

1 level as a starting point for obtaining data --

2 DR. SUFFLING: Do you mean, Ma'am, that  
3 you would have a certain ecosystem type and you  
4 would --

5 MADAM CHAIR: No.

6 DR. SUFFLING: --have to get to know it  
7 better?

8 MADAM CHAIR: Let's assume for the moment  
9 and the evidence before us is that we have invested  
10 considerable resources into developing stand  
11 information, information about individual stands all  
12 over the area of the undertaking.

13 Now, what is the difference for you to  
14 take the stand information and don't worry about which  
15 management unit it is in, but you can have an FRI map  
16 with stand information on it, and why can't you take  
17 information in that way and put it into any type of map  
18 you want based on an ecoregion or district?

19 DR. SUFFLING: Yes.

20 MADAM CHAIR: Because there would be some  
21 variation, but not a large amount, I wouldn't think,  
22 within one individual stand.

23 DR. SUFFLING: Technically that is  
24 feasible. I think the problem will arise with the  
25 actual imposition of management in an area.

1                   We know from our day-to-day experience  
2   how the boundaries between jurisdictions inevitably  
3   start to cause disjunctions in function. Now, some of  
4   those boundaries are necessary, on balance they are the  
5   best we can manage, but if the boundaries are in the  
6   wrong places, and I am not suggesting that all of the  
7   management unit boundaries in the wrong places, then  
8   there will be a tendency because there are different  
9   managers, because there are different local  
10   organizations, even because of differences in  
11   personality, that there will be disjunctions which  
12   don't relate to what is on the land, but relate more to  
13   the organization, structure of the organization.

14                  You can see this in anything from school  
15   boards to companies to universities even.

16                  DR. BENDELL: May I say something, Madam  
17   Chairman, from a land point of view.

18                  These are different lands and they are  
19   going to have different properties and there are going  
20   to be different trees and different wildlife on this  
21   land than the land in the north. So it is very  
22   appropriate then to make your plans on the basis of  
23   particular trees and wildlife that you have, and if you  
24   are doing two at once it makes it more difficult than  
25   just looking after one.

1 MR. MARTEL: But soils would be similar.

2 DR. BENDELL: Not necessarily. Most here  
3 are the deep, sandy, droughty soils. This is the jack  
4 pine heartland and as you go north it is black spruce  
5 and that changes the ball game.

6 MADAM CHAIR: Go ahead, Mr. Hanna.

7 MR. HANNA: Q. I would like to go back  
8 to these six, seven criteria and I want to make sure I  
9 understand how exactly you see these being  
10 administered.

11 I believe we left off talking about the  
12 possibility of catastrophic events in a forest  
13 management unit, a natural catastrophic event that  
14 might force the system outside of the constraints, the  
15 limits that you have set; correct?

16 DR. MIDDLETON: A. (nodding  
17 affirmatively)

18 Q. You have indicated in that particular  
19 circumstance that might lead to the need to stop any  
20 further disturbance of the landscape until it came back  
21 within the limits that you have set. That's the  
22 essence of what you are saying?

23 DR. SUFFLING: A. I would want to see  
24 the individual case before I would be prepared to say  
25 stop.



1                   It might mean, for instance, that you  
2   lost so much of the jack pine type that you didn't  
3   particularly want to take a lot more jack pine out, but  
4   maybe you have plenty of black spruce somewhere else  
5   and you would change the kind of logging that would be  
6   done.

7                   Q.   So with respect to that ecosystem  
8   type that is outside of the limit, the disturbance  
9   would be restricted?

10                  A.   If it was severe, yes.

11                  DR. MIDDLETON:   A.   Mr. Hanna, if I may  
12   add something to that.

13                  Q.   Yes.

14                  A.   You will remember that all of these  
15   prescriptions or guidelines or whatever are with  
16   reference to the starting landscape, existing  
17   landscape.

18                  If we are dealing with a very large  
19   disturbance, a catastrophic fire, for example, of the  
20   type we seem to be talking about here, it might be open  
21   to say that if it is sufficiently large we are really  
22   redefining that starting point again.  If it is really  
23   that large, in those rare case where it is that large,  
24   we might have to go back to scratch again and say that  
25   it has now changed our starting point so severely that

1 we are going to have to redo the plan for here.

2 I would suggest that's not any different  
3 from the perspective that what we are talking about as  
4 compared to the perspective we would face today with  
5 another sort of system. Catastrophic disturbance of  
6 that extent is likely to set any planning system back  
7 to first principles again.

8 DR. SUFFLING: A. In fact, a new plan  
9 would have to be prepared anyway according to the  
10 present rules with a severe disturbance.

11 Q. I was going to deal with the  
12 benchmark issue later, but perhaps since you have  
13 raised it I will deal with it now.

14 My understanding of your evidence was  
15 that you had made specific reference to Exhibit 1714  
16 which is the other wildlife report and page 49, task 2,  
17 you had referred to the reconstruction of a historical  
18 record and using that as the benchmark upon which you  
19 would establish the acceptable deviations that apply in  
20 the criterion; is that correct?

21 DR. MIDDLETON: A. No, it is not  
22 correct.

23 Q. Sorry.

24 A. That's a very small part of the  
25 larger issue that we went into earlier this morning.

1 I will remind the Board that we -- our  
2 statement is that the plans at the moment will be on  
3 the basis of the original landscape with an ultimate  
4 long-term view towards incorporating whatever  
5 historical data we have or become available.

6 I can refer you to Exhibit 1721, the  
7 excerpt from Dr. Plochman's lectures in which this was  
8 made explicit, for example, in European forests, that  
9 we start from what we have, our long-term ultimate  
10 theoretical goal is to incorporate what was there  
11 before, but that is a long-term goal. It certainly is  
12 not a starting point for what we do today or tomorrow.

13 Q. Well, I have two problems with that  
14 suggestion. One is this: If I was a forester working  
15 particularly on a forest management unit I would be  
16 concerned about a moving target. You can understand  
17 that would be a concern; yes?

18 A. This is the concern -- moving target  
19 is the essence of adaptive management really, that as  
20 more information becomes available, including feedback  
21 from what you have done, it calls for adjustments in  
22 what we plan to do next.

23 The only time when we are really free  
24 from a moving target is if we simply start from our  
25 starting data and say that's it without any further

1 feedback. Unless I am misinterpreting your view, I  
2 don't think this is any different from any other kind  
3 of new information that becomes available.

4 Q. Well, I think it is and I will tell  
5 you why. My understanding of adaptive management is  
6 that you learn by doing. My public school's moto was  
7 learn by doing and it must be quite appropriate because  
8 I am an advocate of adaptive management.

9 This isn't learning by doing, what you  
10 are proposing. This is saying, we are going to  
11 continually refine what we thought the original forest  
12 was and as we refine that understanding, then we are  
13 going to change the constraints within which you have  
14 to operate?

15 A. I see the distinction you bring up.  
16 Thank you for explaining that.

17 As I understand it now in that viewpoint,  
18 although we haven't specified this, I don't think the  
19 historical data would ever change a five-year plan, for  
20 example, and it would be at the next iteration of that  
21 planning procedure, whatever new historical data were  
22 available that were deemed to be appropriate to setting  
23 the next set of goals for the next iteration procedure,  
24 would be put in in that case.

25 Roger, I would ask to you to expand on

1       that.

2                   DR. SUFFLING: A. Yes. I think what you  
3       find in practice is that it actually wouldn't be too  
4       bad. The reason for this is the fluctuation in natural  
5       disturbance, which has occurred throughout northern  
6       Ontario for the last 200 years or so.

7                   If you were to look back at the record of  
8       disturbance for the the last 10 years, since -- 15  
9       years, since '75, you would conclude that a very  
10      relatively high rate of fire was natural and normal for  
11      the province.

12                  If you were to look at the record from  
13      the onset of government records in many areas of  
14      northern Ontario, which is generally around 1926, and  
15      if you look to that period forward from '26 to '75 you  
16      would conclude that a very low rate of disturbance was  
17      normal. If you looked further back in the 1890's and  
18      1880's, we don't have very good data, but we know that  
19      there was a tremendous amount of fire during that  
20      period.

21                  So the result of going from the  
22      government data set back to '26 to something further,  
23      you know, some historical sets that you got from  
24      somewhere or created from looking -- or something, you  
25      would generally conclude that the long-term recent



1 record was a period with not too much fire and  
2 historically in fact there have been a lot more fire  
3 than we are used to. So the burns of the last few  
4 years would in some sense not be seen as an abberation  
5 but just a return to the normal.

6 So when you were setting goals for  
7 management, you would say: Oh, dear, we lost this,  
8 that and the other to fires, do we need to cut back on  
9 the harvest total that much and the answer might be:  
10 Well, perhaps not, perhaps this was, you know, par for  
11 the course.

12 Q. Dr. Suffling, the concern I have is  
13 that I understand each of these six criteria describe  
14 different elements of the landscape, the size of the  
15 patches, the area of the patches, a whole variety of  
16 different factors and those factors are defined in  
17 terms of acceptable variation away from the original.

18 A. As we know it, yes.

19 Q. Well, that's the point that I am  
20 trying to deal with. What is the original?

21 DR. MIDDLETON: A. Ultimately the  
22 original, in theory the original pre-human disturbance  
23 per European disturbance, but I think we all recognize  
24 that we simply do not have those data now.

25 So our starting point, as stated in the

1 terms and conditions, is from the existing landscape  
2 with the ultimate goal of incorporating the historical  
3 data as they became available.

4 Q. Now, in reporting, let's deal back  
5 with criteria No. 1.

6 MADAM CHAIR: Excuse me, Mr. Hanna. It  
7 is four o'clock now. Do you have a quick question or  
8 would you rather start tomorrow morning and go through?

9 MR. HANNA: This was actually going to be  
10 a fairly long subject, so perhaps it would be better to  
11 put it off.

12 MADAM CHAIR: Why don't we adjourn now  
13 and start at 9:00 tomorrow morning.

14 Thank you, gentlemen.

15 We are going to go right into the scoping  
16 session I think if everybody is here.

17 MR. LINDGREN: I am appearing on Mr.  
18 Castrilli's behalf, so we can proceed.

19 MADAM CHAIR: Okay, Mr. Lindgren.

20 MR. LINDGREN: Pretend I have a beard.

21 MADAM CHAIR: This is a procedural  
22 matter. People are invited to stay if they want, but  
23 they don't have to.

24 MR. HANNA: We are not cross-examining  
25 this panel, so you will excuse me if we leave.

1 MADAM CHAIR: Fine. Thank you, Mr.  
2 Hanna, Dr. Quinney.

3 I don't think it is going to take a long  
4 time.

5 Ms. Seaborn, are you definitely not  
6 cross-examining Dr. Legator, Forests for Tomorrow's  
7 Panel 8?

8 MS. SEABORN: Madam Chair, I wanted to  
9 wait and get the answers to the supplementary  
10 interrogatories.

11 Before I sent Mr. Castrilli the  
12 questions, I spoke with him on the telephone. He said  
13 that he would attempt to get the answers to me in  
14 writing prior to Dr. Legator's appearances before the  
15 Board.

16 I had understood that Dr. Legator may  
17 only be available for a certain number of days and if  
18 the answers are satisfactory to my client, then I won't  
19 be cross-examining. If I do have questions arising  
20 from the answers, I can assure the Board they will be  
21 quite brief and I will keep in mind the time  
22 constraints that we may be faced with in relation to  
23 this witness.

24 MADAM CHAIR: All right. In the event  
25 that you don't cross-examine, there will just be, Mr.

1 Cassidy, your client, and Mr. Freidin for MNR.

2 While we are on the topic of schedules,  
3 we received the notice today that Dr. Legator will be  
4 available four days.

5 MR. LINDGREN: That's correct. I should  
6 also indicate that Mr. Castrilli anticipates that the  
7 examination-in-chief will be approximately three hours  
8 in length. So we expect that four days should be more  
9 than adequate.

10 MR. CASSIDY: Not having heard the length  
11 of the cross-examinations yet.

12 MADAM CHAIR: Four hours is Mr.  
13 Castrilli's estimate?

14 MR. LINDGREN: He said three hours, Madam  
15 chair.

16 MADAM CHAIR: Three hours. So what does  
17 that do to these weeks -- we are going to be finished  
18 this panel next week, Mr. Lindgren?

19 MR. LINDGREN: Well, based on the  
20 original estimates in the scoping session, a total of  
21 approximately eight hearing days would be necessary  
22 for our Panel No. 9.

23 Now that Mr. Hanna has perhaps whittled  
24 down his statement, we might be finishing on Wednesday,  
25 maybe Thursday. I can't say because I really don't

1 know how long the other parties will be in  
2 cross-examination.

3 MADAM CHAIR: Let's assume we do finish  
4 next week, that takes us through -- what week are we in  
5 now, the 18th?

6 That means we wouldn't -- are you going  
7 to put Panel 10 in the week of the 25th of February?

8 MR. LINDGREN: That's next week. No,  
9 that will be Panel 9 as well.

10 MADAM CHAIR: Oh, excuse me. All right.  
11 Let's say they finish the week of the 25th.

12 MR. LINDGREN: Then the next week will be  
13 Dr. Legator.

14 MADAM CHAIR: Who would be here Tuesday  
15 and Wednesday, the 5th and 6th, and what do you propose  
16 doing for the weeks of the 11th and 18th of March?

17 MR. LINDGREN: I believe they are March  
18 break dates.

19 MADAM CHAIR: Oh good. Good planning,  
20 Mr. Lindgren.

21 MR. LINDGREN: I have you to thank for  
22 that, Madam Chair.

23 MADAM CHAIR: Then we come back the 26th  
24 then.

25 MR. FREIDIN: And 27th.



1                   MADAM CHAIR: You would start your Panel  
2       10 on April the 2nd.

3                   MR. LINDGREN: That's the approximate  
4       schedule that we are intending to follow. We still  
5       have to slot in Dr. Henderson, our last Panel 2 lay  
6       witness.

7                   MADAM CHAIR: Could you possibly put Dr.  
8       Henderson in on March the 4th or the 25th?

9                   MR. LINDGREN: I think it is unlikely I  
10      will get him for the first week of March, but I will  
11      attempt to get him here for the last week of March so  
12      we don't lose a hearing day during that week.

13                  MADAM CHAIR: Okay. Mr. Martel, if we  
14      start Tuesday morning, he has to come in Monday anyway  
15      and it would be better if we could do Dr. Henderson on  
16      the 25th.

17                  MR. LINDGREN: That's a Monday.

18                  MR. CASSIDY: Or the 7th of March.

19                  MADAM CHAIR: You just said the first  
20      week you didn't think he could do that.

21                  MR. LINDGREN: I think that's unlikely.  
22      I am given to understand that that might -- calling him  
23      with short notice might pose a problem for some of the  
24      other parties.

25                  MADAM CHAIR: So for Dr. Henderson, I

1       guess the Board's first choice would be March the 25th  
2       and, secondly, March the 28th.

3               MR. LINDGREN: That's my first choice as  
4       well, Madam Chair. I will put those choices to him.

5               MADAM CHAIR: Yes. It is a longer day on  
6       the 28th.

7               MR. LINDGREN: Correct. I will undertake  
8       to contact Dr. Henderson and ascertain his availability  
9       for those dates.

10              MADAM CHAIR: All right.

11              Dr. Legard's witness statement is very  
12       succinct and we think the Board's areas of interest are  
13       well covered by the statements of issues of at least  
14       two parties who will be cross-examining. So we don't  
15       have a lot of points of clarification, but we have a  
16       few.

17              Our first issue we wish Dr. Legator to  
18       address is found at (ii). Dr. Legator states that he  
19       referred to other studies and texts in evaluating the  
20       hazardous effects of 2,4-D and he means studies and  
21       texts other than those relied on by Drs. Ritter,  
22       Rodericks and Rachman, and our question to Dr. Legator  
23       simply is: Why is he relying on these sources of  
24       information and why didn't the other experts do so.  
25       The Board hasn't examined closely these various sources

1 to see whether there is any overlap, but we would like  
2 that clarification from Dr. Legator.

3 On page (vii), in his summary Dr. Legator  
4 concludes that 2,4-D is a probable multi-organ  
5 carcinogen and the Board simply wishes for Dr. Legator  
6 to clarify that this is his opinion, that in fact the  
7 IARC conclusion was that 2,4-D is a possible human  
8 carcinogen.

9 MR. LINDGREN: I am sorry, could you  
10 repeat that?

11 MADAM CHAIR: That IARC conclusion was  
12 that 2,4-D is a possible human carcinogen and we want  
13 it very clear that this is Dr. Legator's opinion that  
14 it is a probable multi-organ carcinogen.

15 On page 13, in the second paragraph, Dr.  
16 Legator arrives at the conclusion that the Wiggel  
17 epidemiological study in Saskatchewan provides  
18 compelling evidence and substantially adds to the  
19 evidence of the induction of cancer primarily by 2,4-D.

20 This isn't the Board's understanding of  
21 Dr. Ritter's conclusions and we would appreciate if Dr.  
22 Legator would address directly Dr. Ritter's  
23 interpretation of what the Saskatchewan farm workers  
24 study means. For example, with the item on the dollars  
25 spent on fuel and oil for farm purposes there was a

1 great deal of debate before the Board about exactly  
2 what that was measuring, and we would simply like Dr.  
3 Legator to address directly what Dr. Ritter's concerns  
4 were about the meaning of the results of that study.

5 On page 15, in the first paragraph, Dr.  
6 Legator -- in the last sentence of the first paragraph,  
7 Dr. Legator states:

8 "One of the members of the MOE panel has  
9 commented on the extrapolation of cancer  
10 data from animals to humans and has  
11 authored a ranking scheme rather than  
12 using the mathematical models."

13 The Board is lost as to what the  
14 significance of this statement is.

15 On page 16, in the second paragraph, Dr.  
16 Legator states that the conclusion of the MOE panel is  
17 incorrect with respect to the genotoxicity of 2,4-D  
18 and he refers to several positive studies that have  
19 been done to support his argument, and the Board wishes  
20 to know which studies he is referring to and they may  
21 be in the source material book, but he is going to have  
22 to refer us to them.

23 The paragraph that follows that, on page  
24 16, Dr. Legator makes the statement that:

25 "I am unable to identify in the panel

1 report any justification for using 2,4-D  
2 in Ontario Crown forests."

3 Is Dr. Legator prepared to make the  
4 statement that he is not in any way commenting on the  
5 forestry uses for 2,4-D, but in fact is only looking at  
6 it from the view point of risk for human exposure.

7 On page 17, Dr. Legator discusses the  
8 CRUMP risk analysis.

9 MR. LINDGREN: Pardon?

10 MADAM CHAIR: The CRUMP, C-R-U-M-P, risk  
11 analysis which was discussed at great length in front  
12 of the Board and Dr. Legator is critical of the fact  
13 that Crump based his worst-case scenario on animal data  
14 as opposed to results from epidemiological studies, and  
15 the Board wants to know in Dr. Legator's opinion of  
16 what value he thinks the CRUMP risk analysis is to the  
17 Board. It is not clear to us whether in his opinion we  
18 should totally ignore the CRUMP risk assessment or  
19 exactly how he would see it being treated.

20 On page 18, in Section D, Dr. Legator  
21 briefly begins a discussion about reported deaths from  
22 cancer attributed to 2,4-D exposure. Does he know of  
23 any other deaths reported in the literature other than  
24 the ones he refers to with respect to a forestry  
25 worker.



1                   Finally, on page 20, Dr. Legator repeats  
2                   his conclusion that 2,4-D is a probable multi-organ  
3                   carcinogen and should not be used as a herbicide in  
4                   Ontario forests. Is he saying that he believes any  
5                   exposure to any concentration of 2,4-D is a cancer  
6                   risk, or is he saying given the various evidence he has  
7                   examined he believes that it should not be used as a  
8                   herbicide because this would be erring on the side of  
9                   safety; in other words, is he telling the Board that  
10                  yes, the evidence is strong to stop the use of 2,4-D,  
11                  or is he saying the evidence is of concern and any  
12                  concern about human health should be a sufficient  
13                  factor in the decision.

14                  Do we have any sense from your client,  
15                  Mr. Cassidy, or do you know how long you are going to  
16                  be with respect to cross-examination, and Mr. Freidin?

17                  MR. CASTRILLI: I spoke to Ms. Cronk who  
18                  is going to be handling this and she said at this point  
19                  she will be a day.

20                  There are a couple of points she asked me  
21                  to make. One, she has indicated she has a concern  
22                  about -- we have no objection to the scheduling as  
23                  proposed by Mr. Castrilli, other than the fact that it  
24                  represents two lost hearings days, and that is why I  
25                  made the comment that to whatever extent possible we

1 will certainly be prepared to deal with Mr. Henderson  
2 or any other witness that Forests for Tomorrow can call  
3 to make up that lost time.

4 The other comment that she wanted me to  
5 pass on is that there is a supplementary source book  
6 referred to in answers to interrogatories filed in this  
7 panel which we have not seen yet and are in the process  
8 of trying to obtain which may impact on the nature of  
9 the cross-examination.

10 The third matter was that there may be  
11 supplementary interrogatories, very few in number. I  
12 simply advise Mr. Lindgren of that. At this point that  
13 decision has not been made, other than to note that if  
14 there are supplementary interrogatories there will be  
15 very few.

16 MR. LINDGREN: Madam Chair, with respect  
17 to the filing of the supplementary source book. I, in  
18 fact, filed that with Mr. Pascoe I believe yesterday,  
19 on Monday, and there is just the single copy. So it is  
20 available to the parties if they care to have it.

21 MADAM CHAIR: It is right here, Mr.  
22 Cassidy. You can make arrangements to borrow it and  
23 copy it or whatever.

24 Mr. Freidin?

25 MR. FREIDIN: Two days.

1 MADAM CHAIR: You will be  
2 cross-examining?

3 MR. FREIDIN: Yes.

4 MR. LINDGREN: Madam Chair, I have one  
5 comment in relation to the statements of issue filed by  
6 MNR and the Industry. The same comment pertains to  
7 both of them.

8 The Industry has indicated that they  
9 cross-examining Dr. Legator on his experience and  
10 knowledge concerning tending activities in the area of  
11 the undertaking and the use in timber management  
12 activities of 2,4-D.

13 I have similar statements from the MNR  
14 statement of issues.

15 Dr. Legator has reviewed the relevant  
16 evidence, but it is quite clear that he will be  
17 qualified as a toxicologist and as a consequence he has  
18 no knowledge of the tending activities within the area  
19 of the undertaking, and certainly any questions about  
20 tending or site preparation are far beyond his area of  
21 expertise and, therefore, we expect that those kinds of  
22 questions will not be asked of Dr. Legator.

23 MR. FREIDIN: Madam Chair, I think the  
24 concern that was raised was similar to the one that you  
25 raised about the exposure; is he saying any exposure to

1 any concentration, et cetera.

2 I am not going to ask about his  
3 knowledge. He may say he has no knowledge and I will  
4 explore with him what his views are in terms of the  
5 importance of looking at factors such as exposure and  
6 concentration and those sorts of things. I won't be  
7 asking him to comment on whether my information is  
8 correct or not.

9 So it is that type of cross-examination  
10 that I will be dealing with which I think probably he  
11 will be able to deal with, I hope. He should be able  
12 to deal with it.

13 MADAM CHAIR: Yes. I think the point is  
14 that we are not going to ask Dr. Legator -- it could be  
15 any application of 2,4-D. We will be talking about  
16 risks of exposure and concentrations and so I think the  
17 activity behind it is not important, and I just want to  
18 clear up in his conclusion that he was talking about  
19 public health and not the need of the forest industry  
20 to use those chemicals.

21 MR. LINDGREN: I think that's a valid  
22 line of questioning. My only concern was that Dr.  
23 Legator might be presented with a series of questions  
24 on the nature and extent of 2,4-D--

25 MR. FREIDIN: No.

1 MR. LINDGREN: --used during tending  
2 operations.

3 MADAM CHAIR: Mr. Martel and I will be  
4 here and that won't happen.

5 MR. LINDGREN: Thank you.

6 MR. FREIDIN: I think that if in fact his  
7 comment that it is a risk is based on his reading of  
8 the evidence and he has interpreted the evidence and  
9 says it occurs this frequently in these concentrations  
10 and that's the basis of his conclusion in whole or in  
11 part, then I would expect him to say that. That's what  
12 I am getting at.

13 Madam Chair, if I might, I just have two  
14 questions and perhaps -- and this just affects by  
15 preparation.

16 Can Mr. Lindgren confirm that what we  
17 have indicated in item No. 3 of our statement of issues  
18 that this witness will only be speaking to the  
19 potential human health effects of 2,4-D and no other  
20 products? Are we just dealing with 2,4-D because  
21 that's all the witness statement does? I don't want  
22 any surprises.

23 MADAM CHAIR: Well, in the beginning of  
24 his statement Mr. Legator said that's all he did.  
25 Regretfully he said that's all he did.



1 I expect there will be no other  
2 discussion other than the fact he mentions several  
3 times that 2,4-D usually occurs in mixtures, but there  
4 is no evidence before us with respect to multiple  
5 compounds. He is just looking at 2,4-D.

6 MR. LINDGREN: That is correct.

7 MR. FREIDIN: And he won't be talking  
8 about efficacy at all, whether 2,4-D is an effective  
9 tool for timber management purposes.

10 MR. LINDGREN: I think that's a tending  
11 question.

12 MADAM CHAIR: That's a taken. I mean, we  
13 won't be listening to Dr. Legator talk about forestry  
14 as far as I know.

15 MR. FREIDIN: Fine. Thank you.

16 MADAM CHAIR: Anything else we want to  
17 discuss about Panel 9?

18 MR. LINDGREN: Panel 8.

19 MADAM CHAIR: Panel 8.

20 MR. FREIDIN: Do you want to set a date  
21 for Panel 10?

22 MADAM CHAIR: I think that we should. We  
23 said that Panel 10 will probably start the first week  
24 in April?

25 MR. LINDGREN: That's our plan schedule.

1 MADAM CHAIR: All right.

2 MS. SEABORN: Perhaps we should do it  
3 just before the March break.

4 MADAM CHAIR: I think we should.

5 MR. LINDGREN: Set the date?

6 MS. SEABORN: To file the statements of  
7 issues at least.

8 When will the interrogatories responses  
9 be available, Mr. Lindgren?

10 MR. LINDGREN: I have no information on  
11 that.

12 MADAM CHAIR: Well, why don't we set a  
13 deadline for the submission of the statements of issues  
14 some time during the week of March the 4th and have the  
15 scoping session some time during the week of March the  
16 25th. That's a week before.

17 MR. CASSIDY: Perhaps I can suggest March  
18 6th, being a Wednesday, since we are all going to be  
19 here and everybody is around and Mr. Martel has  
20 something to read with him on the plane the next day,  
21 filing for the statement of issues, and then the  
22 scoping issue would be --

23 MADAM CHAIR: The 26th.

24 MR. CASSIDY: The 26th. Not that you  
25 don't have lots to read, Mr. Martel.

1 MADAM CHAIR: All right. We will set  
2 those dates.

3 MR. MARTEL: I enjoy it all.

4 MS. SEABORN: Especially during March  
5 break.

6 MADAM CHAIR: At four o'clock.

7 MR. FREIDIN: Madam Chair, are you able  
8 to comment on Mr. Castrilli's request that we start  
9 early on Tuesday, March the 5th at 9 a.m.?

10 MADAM CHAIR: It is going to be -- well,  
11 it is always a problem for Mr. Martel because he is the  
12 only one who travels every day.

13 Well, let's ask Mr. Martel. Are you  
14 going to start at nine o'clock on March the 5th?

15 MR. MARTEL: It doesn't make me happy to  
16 do so.

17 MR. FREIDIN: I have no preference, I  
18 just wanted to make sure what time we started.

19 MR. CASSIDY: You didn't in fact request  
20 it. It was Mr. Castrilli.

21 MR. MARTEL: I just look at the time. If  
22 one is playing it close to the best, if Mr. Castrilli  
23 it three hours, Ms. Cronk a day.

24 MS. SEABORN: Could we sit until five on  
25 the Tuesday if we started at the usual starting time to

1 accommodate Mr. Martel's flight?

2 ---Discussion off the record

3 MADAM CHAIR: We will start at 9 a.m. on  
4 March the 5th and we can express our appreciation to  
5 Mr. Martel's good nature and total dedication to the  
6 job.

7 All right. Is there anything else?

8 Mr. Freidin?

9 MR. FREIDIN: No. I have a problem  
10 relating to the schedule for September.

11 MADAM CHAIR: September?

12 MR. FREIDIN: September.

13 MADAM CHAIR: September?

14 MR. FREIDIN: Let's not deal with it now.

15 MADAM CHAIR: Mr. Pascoe, what happens  
16 when we finish for Forests for Tomorrow's case? Where  
17 do we go after that?

18 MR. PASCOE: We go to Red Lake.

19 MADAM CHAIR: Yes. We are not sure how  
20 we are going to handle this, the scoping business  
21 for --

22 MR. PASCOE: Three small parties are  
23 scheduled, one for the 11th of April, one for the 29th  
24 and 30th of April and one for the 1st and 2nd of May  
25 and then we will go to Red Lake the next week.

1 MR. MARTEL: But we have to scope Treaty  
2 3.

3 MR. PASCOE: That's right. Mr. Colborne  
4 is out of the country until Monday and he will be  
5 getting back to me at that date. We thought we would  
6 scope Panel 1 and 2 on the same day and then perhaps  
7 scope the rest of the panels once we --

8 MADAM CHAIR: In Toronto. He will come  
9 down for that?

10 MR. PASCOE: Yes.

11 MADAM CHAIR: Then that isn't any  
12 problem.

13 With respect to the three groups who will  
14 be giving evidence here and require a half day or a  
15 day, I don't think we are going to call them down from  
16 northern Ontario to come here for a scoping session.

17 The Board would expect the parties to  
18 talk directly to them with their concerns and we will  
19 be asking Mr. Pascoe to get from you the amount of time  
20 you think you are going to be in cross-examination and  
21 you won't be hearing from us unless it is not  
22 accomodated by the schedule or there is some problem  
23 with respect to -- well, I hope you are not going to  
24 pose a lot of interrogatories. Obviously, you are  
25 going to want to ask for some clarification of their



1 written material, but I don't think the Board will  
2 approve of lengthy written interrogatories to any of  
3 those three parties, Mr. Pascoe?

4 MR. PASCOE: That's right.

5 MADAM CHAIR: Who are they again, please?

6 MR. PASCOE: Originally scheduled, we  
7 have the Canadian Association of Professional Heritage  
8 Consultants, April 9th and 30th; we have the Ontario  
9 Professional Foresters Association, May 1st and 2nd,  
10 and I am informed by both of those parties that they  
11 probably will not take two days.

12 On April the 11th, and I am sending out a  
13 memo to this effect tomorrow, the Northwestern Ontario  
14 Associated Chamber of Commerce, Red Lake/Ear Falls  
15 Joint Municipal Committee, which was going to be making  
16 a presentation in Red Lake and then cancelled, will now  
17 be make a presentation in Toronto less than a day on  
18 April the 11th. I will be sending out a memo with all  
19 the dates for the filing.

20 MR. CASSIDY: I just note that the OPFA  
21 is based in Toronto. If the Board determines that a  
22 scoping session is necessary, they are not required to  
23 come down from northern Ontario.

24 MADAM CHAIR: No, that's right, Mr.  
25 Cassidy.

1 I think what we will ask you to do is,  
2 Mr. Pascoe will handle this, but the sooner you can  
3 inform Mr. Pascoe about what you will be doing about  
4 these witness statements and how much time you think  
5 you want for cross-examination the better, and then at  
6 that point we can make arrangements if we have to have  
7 a meetins with them or something has to be ironed out.

8 MS. SEABORN: Perhaps Mr. Pascoe could  
9 send out a letter to all the full-time parties asking  
10 them to advise him by a certain date, sometime in  
11 March, as to whether or not they intend to  
12 cross-examining.

13 MR. PASCOE: That will be going out  
14 tomorrow.

15 MS. SEABORN: I have only see the OPFA  
16 witness statement. Will the Chamber of Commerce be  
17 filing a written submission?

18 MR. PASCOE: Yes. The CAPHC was  
19 originally supposed to file on Friday the 15th. They  
20 will be filing tomorrow, as I understand it, and the  
21 OPFA will be filing by this Friday.

22 MR. FREIDIN: They have filed.

23 MR. PASCOE: I'm sorry.

24 MR. CASSIDY: NOACC.

25 MR. PASCOE: NOACC will be filing on

1 Friday.

2 MADAM CHAIR: Red Lake, which dates are  
3 we sitting in Red Lake?

4 MR. PASCOE: Okay. We have an open house  
5 May 6th, we have the community hearing May 7th, which  
6 is the Tuesday, on May the 8th we will be hearing  
7 CASIT, Canadian Association of Single Industry Towns.

8 I am informed by Bob Axford that he  
9 expects that to go no longer than two days, so that's  
10 May the 8th and May the 9th. We have also scheduled  
11 the 10th if necessary, but at this point it looks as  
12 though we won't be needing the 10th which is a Friday.

13 MADAM CHAIR: Mr. Pascoe, could you put  
14 down the Red Lake meeting as well so the parties can  
15 respond to whether they are going to cross-examine and  
16 how long it will take.

17 MR. PASCOE: Yes.

18 MADAM CHAIR: And we are also having a  
19 satellite hearing in Red Lake?

20 MR. PASCOE: In Red Lake on May 7th.

21 MR. FREIDIN: Did Mr. Axford indicate  
22 that two days out of that was for his own evidence or  
23 not because I think he was talking about ten  
24 depositions and knowing Mr. Axford he may want to take  
25 up the whole two days with his case?

1 MR. CASSIDY: Depositions?

2 MR. FREIDIN: That's what he says. He  
3 refers to them as depositions.

4 MR. PASCOE: He had originally wanted us  
5 up there for two weeks, now he has scaled that back to  
6 two days, as far as I understand.

7 MADAM CHAIR: But that's without any  
8 cross-examination?

9 MR. PASCOE: No, that is --

10 MADAM CHAIR: Was Mr. Axford talking to  
11 you, the parties, about how long you might take?

12 MR. CASSIDY: No.

13 MS. SEABORN: We haven't seen his written  
14 material yet.

15 MR. PASCOE: That is to be submitted  
16 March 15th.

17 MADAM CHAIR: All right. That takes us  
18 then into the beginning of the Grand Treaty No. 3 case.

19 MR. PASCOE: We have a week off, May 3th  
20 to 17th, and we start in Kenora on the 21st of May with  
21 an open house. We have a community hearing in Kenora  
22 on the 22nd and then on the 23rd of May Grand Council  
23 Treaty 3 is scheduled to begin their evidence.

24 MADAM CHAIR: Have you discussed with Mr.  
25 Colborne a date for scoping his two panels?

1                   MR. PASCOE: As mentioned, he is out of  
2                   the country until Monday and then we thought what we  
3                   would do is to schedules scoping in Toronto for his  
4                   first two panels and then perhaps once we are up there  
5                   we may scope the rest of rest of them.

6                   He also indicated that he may be filing  
7                   in total seven witness statement. As I understand now  
8                   five have been filed.

9                   MS. SEABORN: If Mr. Colborne is going to  
10                  Red Lake we could always scope in Red Lake which would  
11                  be novel.

12                  MADAM CHAIR: That's a good idea, Ms.  
13                  Seaborn. He won't be in Red Lake, though, I doubt it.  
14                  I don't know why I say that, but...

15                  MS. SEABORN: I am trying to think of a  
16                  way to avoid him having to come to Toronto for a  
17                  scoping session for the first couple of panels.

18                  MADAM CHAIR: That's right.

19                  MR. PASCOE: I have already raised that  
20                  issue with his secretary and I will speak to him about  
21                  it.

22                  MADAM CHAIR: Mr. Martel suggested that  
23                  we could all go up to Thunder Bay for the day.

24                  All right. Thank you very much. See you  
25                  at nine o'clock tomorrow morning.



1           ---Whereupon the hearing was adjourned at 4:35 p.m., to  
2           be reconvened Wednesday, February 20, 1991  
3           commencing at 9:00 a.m.











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